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Volume III

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U.S. Department of the Interior
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MINERALS YEARBOOK

Area Reports: International 2010

Europe and Central Eurasia

Volume III

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U.S. DEPARTMENT OF THE INTERIOR
KEN SALAZAR, Secretary

U.S. GEOLOGICAL SURVEY
Marcia K. McNutt, Director

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Foreword

This edition of the U.S. Geological Survey (USGS) Minerals Yearbook discusses the performance of the worldwide minerals and materials industries during 2010 and provides background information to assist in interpreting that performance. Content of the individual Minerals Yearbook volumes follows:

- Volume I, Metals and Minerals, contains chapters about virtually all metallic and industrial mineral commodities important to the U.S. economy. Chapters on survey methods, summary statistics for domestic nonfuel minerals, and trends in mining and quarrying in the metals and industrial mineral industries in the United States are also included.
- Volume II, Area Reports: Domestic, contains a chapter on the mineral industry of each of the 50 States and Puerto Rico and the Administered Islands. This volume also has chapters on survey methods and summary statistics of domestic nonfuel minerals.
- Volume III, Area Reports: International, is published as four separate reports. These regional reports contain the latest available minerals data on more than 190 foreign countries and discuss the importance of minerals to the economies of these nations and the United States. Each report begins with an overview of the region's mineral industries during the year. It continues with individual country chapters that examine the mining, refining, processing, and use of minerals in each country of the region and how each country's mineral industry relates to U.S. industry. Most chapters include production tables and industry structure tables, information about Government policies and programs that affect the country's mineral industry, and an outlook section.

The USGS continually strives to improve the value of its publications to users. Constructive comments and suggestions by readers of the Minerals Yearbook are welcomed.

Marcia K. McNutt, Director

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Contacts

Information about the U.S. Geological Survey, its programs, staff, and products may be accessed on the Internet at http://www.usgs.gov or by contacting the Earth Science Information Center at 1-888-ASK-USGS. For specific information about this publication, contact the Chief, Global Minerals Analysis Section, National Minerals Information Center (NMIC), at (703) 648-7732, or the NMIC secretary at (703) 648-4961. Additional minerals information may be accessed on the Internet at http://minerals.usgs.gov/minerals.

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Acknowledgments

The Country Specialists in the National Minerals Information Center, U.S. Geological Survey, in preparing the International Review regional books of volume III of the Minerals Yearbook, extensively use statistics and data on mineral production, consumption, and trade provided by various foreign Government minerals and statistical agencies through various official publications. The cooperation and assistance of these organizations are gratefully acknowledged. Statistical and informational material was also obtained from reports of the U.S. Department of State, United Nations publications, and the domestic and foreign technical and trade press. Of particular assistance were reports submitted by the Resource Reporting Officers and other officers of the Department of State in U.S. Embassies worldwide. Their contributions are sincerely appreciated. Internal statistical support was provided by the staff of the Data Collection and Coordination Section of the National Minerals Information Center.

The regimes of some countries reviewed in this volume may not be recognized by the U.S. Government. The information contained herein is technical and statistical in nature and is not to be construed as conflicting with or being contradictory of U.S. foreign policy.

John H. DeYoung, Jr.
Director, National Minerals Information Center

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The Mineral Industries of Europe and Central Eurasia

By Alberto Alexander Perez, Mark Brininstool, Elena Safirova, Steven T. Anderson, Harold R. Newman, Glenn J. Wallace, and David R. Wilburn

Europe and Central Eurasia as defined in this volume encompasses territory that extends from the Atlantic coast of Europe to the Pacific coast of the Russian Federation and includes the British Isles, Iceland, and Greenland (a self-governing part of the Kingdom of Denmark).

The European Union (EU) is a supranational entity that at yearend 2010 comprised the following 27 countries: Austria, Belgium, Bulgaria, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and the United Kingdom. The euro (€) operates as a single currency for countries within the EU that have fulfilled the stated requirements of the European Central Bank (located in Frankfurt, Germany) for inclusion in the euro area. As of January 1, 2011, the EU countries that were part of the euro area were Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.

Croatia signed an accession treaty with the EU in December 2011 and was to become part of the EU, pending ratification of the treaty, on July 1, 2013. Other countries that were candidates to join the EU were Iceland, Macedonia, Montenegro, Serbia, and Turkey (although no date was given for expected accession, as they were still in the negotiation stage). Albania, Bosnia and Herzegovina, and Kosovo (under UN Security Council Resolution 1244) were considered potential candidate countries and were expected to continue negotiations for EU candidate country status (European Commission, 2007a; 2007c, p. 2–8; 2011; European Union, undated).

The Commonwealth of Independent States (CIS) was founded in 1991 by several Republics of the former Soviet Union and later was extended to include all the former Soviet Republics except the Baltic States of Estonia, Latvia, and Lithuania. The countries that made up the CIS in 2010 were Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, and Uzbekistan. Georgia withdrew from the CIS in 2008, and Ukraine was not officially a member, although it continued to cooperate and participate in CIS-related agreements. The CIS does not have supranational powers, and all member countries have equal standing under international law. Although the member countries had pledged to work on economic integration, few actual measures have been taken to make the CIS a functioning integrated economic bloc similar to that of the EU.

An agreement was signed by the CIS countries in 2001 that allowed the signatories to settle disputes regarding mineral development in border areas, to implement environmental measures to protect the population of the neighboring states when developing mineral resources, and to specify conditions for cooperation between neighboring CIS states in mineral development. One of the basic documents regulating these matters was the Model Law Code, which was signed by the Inter-Parliamentary Assembly of the CIS countries in 2002. The Model Law Code deals with a wide range of issues regarding minerals and mineral development. The CIS's Inter-Governmental Council coordinates more than 10 joint programs and projects relating to scientific and technical cooperation, harmonizes laws about the use of resources, and engages in information exchange.

A customs union agreement between Belarus, Kazakhstan, and Russia went into effect on January 1, 2010. According to the agreement, the countries form a joint customs territory on which no customs duties or other economic restrictions on the movement of goods apply. Each of the members of the customs union applies the same customs rates and trade regulations for goods from the other two countries in the union. The members of the customs union were projected to save more than $400 billion by 2015 owing to reduced shipping times. Kyrgyzstan and Tajikistan expressed their interest in joining the customs union in the future.

The European Free Trade Association (EFTA), which is an alternative entity to the EU in Western Europe, comprised Iceland, Liechtenstein, Norway, and Switzerland. The Agreement on the European Economic Area (EEA), which had been in force since January 1, 1994, brings all the 27 EU members and 3 of the EFTA members (Iceland, Liechtenstein, and Norway) into a single internal market. The EEA provides for the free movement of goods, services, persons, and capital among the 30 EEA states. Switzerland was not part of the EEA but had a bilateral agreement with the EU that addresses the same issues covered by the EEA (European Free Trade Area, 2010).

The EU population in 2010 was roughly 502 million people, which was about 60% more than that of the United States. The EU's total gross domestic product (GDP) based on purchasing power parity was approximately equal to that of the United States (tables 1, 2).

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- Albania—Institute of Statistics (INSTAT);
- Armenia—National Statistical Service;

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- Austria—Bundesministerium für Wirtschaft, Familie und Jugend;
- Azerbaijan—State Statistical Committee of the Azerbaijan Republic;
- Belarus—Ministry of Statistics and Analysis of the Republic of Belarus;
- Belgium—Statistics Belgium (StatBel);
- Bosnia and Herzegovina—Agency for Statistics of Bosnia and Herzegovina;
- Croatia—Statistical Information and Documentation Division;
- Cyprus—The Mine Service; Ministry of Agriculture, Natural Resources and Environment;
- Czech Republic—Czech Geological Survey, Ministry of Industry and Trade;
- Denmark—Danmark og Gronlands Geologisk Undersogelse;
- Estonia—Geological Survey of Estonia;
- Finland—Statistics Finland;
- France—Bureau de Recherches Géologiques et Minières (BRGM);
- Georgia—National Statistics Office;
- Germany—Bundesanstalt für Geowissenschaften und Rohstoffe;
- Hungary—Magyar Köztársaság Gazdasági Ès Közlekedési Minisztérium Magyar Geológiai Szogálat (Hungarian Geological Survey);
- Iceland—Statistics Iceland;
- Ireland—Geological Survey of Ireland; Central Statistics Office;
- Italy—Istituto Nazionale di Statistica (ISTAT);
- Kazakhstan—Agency on Statistics;
- Kyrgyzstan—Ministry of Foreign Affairs;
- Latvia—Central Statistical Bureau of Latvia;
- Lithuania—Statistics Lithuania;
- Luxembourg—Central Statistical Service;
- Montenegro—Statistical Office of the Republic of Montenegro;
- Netherlands—Staatstoezicht op de Mijnen [State Supervision of Mines];
- Poland—Central Statistical Office;
- Portugal—IGM-Division of Statistical Studies;
- Romania—National Institute of Statistics;
- Slovakia—Statistical Office;
- Slovenia—Slovenian Government;
- Spain—Instituto Geologico y Minero de España;
- Ukraine—State Statistics Committee; and
- United Kingdom—British Geological Survey.

General Economic Conditions

In 2010, the global mineral industry underwent a significant recovery, both in demand and prices. Growing demand, primarily in China, was a significant factor for this continued recovery. World trade continued to increase; however, by the second half of 2010, this economic upswing seemed to slow down. The general market recovery was uneven, and was driven mostly by the increases in the exports of goods from Brazil, China, and India as well as other Asian economies, which had reached or surpassed pre-world-recession levels. By the third quarter of 2010, the exports of developed economies were on average still 8% less than pre-recession levels, in terms of value (United Nations, 2011, p. 20). Although the economy of the region as a whole had average growth of 1.8%, the economies of such countries as Belarus (7.6%), Moldova (6.9%), Ukraine (4.2%), and Russia (4%) grew at a much faster rate in 2010 (International Monetary Fund, 2011, p. xii).

The EU countries were substantial participants in the world mineral economy and occupied an important role mostly as processors and consumers of most major mineral commodities. In Central Eurasia, however, the mining of several mineral commodities remained important. The region of Europe and Central Eurasia accounted for 53.5% of total world production of lignite coal, 47.4% of uranium production (measured in U_3O_8 content), and 44.9% each of platinum and potash (in K_2O equivalent) production. The region's output of palladium accounted for 42.7% of world production; titanium, 42.4%; and nickel, 35.4%. The region also produced 21.7% of the world's output of primary aluminum, 20.1% of the world's output of copper, and 19.8% of the world's output of crude steel. The EU was practically self-sufficient in the production of construction materials and remained among the world's leading producers of natural gas. Russia accounted for 25.9% of total natural diamond (gemstone and industrial) production in the world. The region was a large crude oil producer and had significant coal reserves (table 4).

In 2010, Central Eurasia remained a major world supplier of mined and processed minerals, and the consumption of these commodities in the region had increased in the past few years. The countries that made up Central and Eastern Europe (CEE) and the CIS produced mineral commodities mainly for export, and the output of mineral commodities in these countries was significantly influenced by economic conditions in the rest of the world. China and the EU were especially significant markets for mineral products from CEE and the CIS. As economies began to show signs of recovering from the global economic crisis that began in 2008, consumption of mineral commodities increased and drove the recovery of production in CEE and the CIS.

In the CIS, Russia and Kazakhstan were the two leading producers of mineral commodities. In Russia, the value of mining and quarrying output increased by 32% as the value of exports of mineral products increased by 34.1%. Exports of metals, precious stones, and articles thereof increased by 33.1%. Russia's exports of mineral products made up 68.8% of the country's total exports, and exports of metals, precious stones, and articles thereof made up another 13% (Federal State Statistics Service of the Russian Federation, 2011a, b).

Russia, which occupied about 77% of the territory of the CIS, was by far the largest country in the CIS in terms of both population and territory and had the leading mineral producing sector. Many other CIS countries also were significant producers and processors of minerals. In 2010, Russia ranked among the leading world producers or was a significant producer of such mineral commodities as aluminum, arsenic, asbestos, bauxite, boron, cadmium, cement, coal, cobalt, copper, diamond, fluorspar, gold, iron ore, lime, lithium, magnesium compounds

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and metals, mica (scrap sheet and flake), natural gas, nickel, nitrogen, oil shale, palladium, peat, petroleum, phosphate rock, pig iron, platinum, potash, rhenium, silicon, steel, sulfur, tin, titanium sponge, tungsten, uranium, and vanadium.

In Kazakhstan, the value of mining and quarrying output increased by 31% as the value of exports of mineral products increased by 40%. The value of base-metal exports increased by 48%. Mineral product exports made up 75% of the value of Kazakhstan's total exports, and base metals and articles thereof made up another 14% (Agency of Statistics of the Republic of Kazakhstan, 2011, p. 92, 137).

Kazakhstan was a significant producer of such mineral products as arsenic, barite, beryllium metal, bismuth, cadmium, chromite, copper, ferroalloys, lead, petroleum, rhenium, titanium sponge, uranium, and zinc. Ukraine was a significant producer of such mineral products as ferroalloys, iron ore, manganese ore, pig iron, steel, and titanium raw materials. Other CIS countries were significant world or regional producers of one or more mineral commodities, including Armenia (molybdenum), Azerbaijan (petroleum), Belarus (potash), Kyrgyzstan (antimony metal, gold, and mercury ore and metal), Tajikistan (aluminum and antimony ore), Turkmenistan (natural gas), and Uzbekistan (gold and uranium), and all the CIS countries produced a range of other mineral commodities.

The EU was mostly dependent on imported mineral raw materials for metals, industrial minerals, and fuel minerals. The import dependence for many metal ores was 100% [antimony, cobalt, ilmenite, molybdenum, niobium, platinum-group metals (PGMs), rare-earth metals, rutile, tantalum, and vanadium] and the EU was from 70% to 90% import dependent for most other metallic ores. The EU's dependence on imports of metallic mineral raw materials (such as concentrates, ores, and scrap) and obtaining sources of energy for its metal refining and processing industries were key concerns for the EU's mineral industry (Bundesanstalt für Geowissenschaften und Rohstoffe, 2008, p. 19, 22; European Commission, 2008b).

As a major world mineral processing and consuming area, the EU remained a significant determinant of world demand for nearly all mineral commodities. Its mineral processing and manufacturing industries accounted for a significant share of the world production of semimanufactured and fabricated ferrous and nonferrous metals. In 2010, Germany was still the EU's dominant smelter and refiner of most metals. With a high per capita income and standard of living, the EU was one of the world's major consumers of mineral fuels and of mineral products in consumer goods.

Legislation

On December 2, 2010, the new regulation concerning measures to safeguard the supply of gas into the EU [Regulation (EU) 994/210] went into effect and essentially repealed the previous Council Directive 2004/67/EC. The purpose of this new regulation is to ensure that member states of the EU and gas market participants have enough notice to take action to prevent and mitigate the potential effects of disruptions to gas supplies. This regulation was the result of negotiations principally between the EU and Russia in response to the events of January 2009, when gas supplies to the EU were severely disrupted because of a disagreement between Russia and Ukraine on gas deliveries and payment (European Commission, 2006; 2007b, d; 2008a, p. 4, 16; 2009, p. 2–4; 2012).

On November 4, 2008, the European Commission (EC) adopted a new raw materials initiative that included measures to secure and improve access to minerals for the EU. This initiative was expected to result in the adoption of a new raw materials (minerals) strategy for the EU, which would be based upon the following three main objectives:

- Ensure EU access to raw materials from international markets under the same conditions as other industrial competitors;
- Set the right framework conditions within the EU to foster a sustainable supply of raw materials from European sources; and
- Boost overall resource efficiency and promote recycling to reduce the EU's consumption of primary raw materials and decrease the EU's relative import dependence.

The EC expected to finalize a raw materials strategy for the EU in 2011. In May 2009, the EC formed a working group to better define the critical minerals for the EU and another to exchange information on best practices for land use planning, permitting, and geologic knowledge sharing between EU members. At the end of June 2010, the final reports of these two working groups were presented at the European Minerals Conference 2010 (Commission of the European Communities, 2008).

In March 2007, the EU Heads of State and Government set a series of climate and energy targets to be met by 2020, including the following three:

- A reduction in EU greenhouse gas emissions of at least 20% below 1990 levels;
- A minimum 20% of EU energy consumption coming from renewable resources; and
- A 20% reduction in primary energy use compared with projected levels, to be achieved by improving energy efficiency.

On June 25, 2009, Directive 2009/29/EC of the European Parliament and of the Council (of April 23, 2009) entered into force to amend Directive 2003/87/EC [which established the greenhouse gas emission allowance trading scheme (ETS) for the EU], with the main goals of improving the ETS and extending it beyond 2012 (European Parliament and Council, 2009, p. 63–68, 71–74; European Commission, 2010).

Exploration

Several countries of Europe and Central Eurasia continued to explore for nonfuel minerals and uranium in 2010. According to the Metals Economic Group (MEG) of Canada, the exploration budget for nonfuel mineral exploration in Russia amounted to about $430 million and accounted for about 4% of the worldwide planned exploration budget in 2010 (Metals Economics Group, 2010a, b). In terms of the number of exploration sites, the greatest amount of exploration in Europe and Central Eurasia took place in Kazakhstan, Russia, and Scandinavia (particularly Finland and Sweden). Russia accounted for about 19% of the exploration sites in this region, Sweden accounted for 9%, Finland accounted for about 6%, and

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Kazakhstan accounted for 5%. Exploration activity in the CIS was focused primarily on gold (37%), copper (18%), uranium (15%), PGM (9%), nickel (8%), silver (7%), and antimony, iron ore, molybdenum, and zinc (6% combined). European mineral exploration was focused primarily on gold (41%), base metals (32%), iron ore (13%), uranium (7%), and PGM (4%) (Wilburn, Vasil, and Nolting, 2011, p. 58–75).

The Kazakhstan Government announced plans for its President to sign off on revised subsoil usage laws to end the moratorium on issuing new exploration licenses. The moratorium had been in effect for the past 2 years (Engineering and Mining Journal, 2010).

Commodity Overview

This report includes commodity outlook tables. Estimates for production of major mineral commodities for 2010 and beyond have been based upon supply-side assumptions, such as announced plans for increased production/new capacity construction and bankable feasibility studies. The outlook tables in this summary chapter show historic and projected production trends; therefore, no indication is made about whether the data are estimated or reported and revisions are not identified. Data on individual mineral commodities in tables in the individual country chapters are labeled to indicate estimates and revisions. The outlook segments of the mineral commodity tables are based on projected trends that could affect current producing facilities and on planned new facilities that operating companies, consortia, or Governments have projected to come online within indicated timeframes. Forward-looking information, which includes estimates of future production, exploration and mine development, cost of capital projects, and timing of the start of operations, are subject to a variety of risks and uncertainties that could cause actual events or results to differ significantly from expected outcomes. Projects listed in the following section are presented as an indication of industry plans and are not a USGS prediction of what will take place.

Metals

Bauxite and Alumina and Aluminum.—In 2010, Russia and Kazakhstan accounted for the majority of bauxite production in the region with production of 5.48 million metric tons (Mt) and 5.31 Mt, respectively. It was expected that bauxite production would increase gradually in Russia to a projected output of 5.6 Mt by 2017 whereas bauxite production in Kazakhstan was projected to increase to 5.5 Mt by 2017. Russia was the leading individual producer of primary aluminum in Europe and Central Eurasia, producing 3.9 Mt in 2010. The next ranked producers in the region were Italy, 1.4 Mt; Norway 1.1 Mt; Germany, 1.04 Mt; and Iceland, 815,000 metric tons (t). The projected output of primary and secondary aluminum in Russia was 4.4 Mt by 2017. Production was also expected to increase in Italy to 1.5 Mt by 2017; Norway, 1.2 Mt; and Germany, 1 Mt (tables 4, 5, 6).

In Ireland, United Company RUSAL (RUSAL) restored operations at its alumina refinery, which was operated by Aughinish Alumina plc and was located on Aughinish Island on the south side of the Shannon estuary near Limerick City. Aughinish Alumina produced about 1.86 Mt of alumina in 2010, which was an increase of 50% compared with production in 2009. The output was obtained by treating bauxite ore using the Bayer process (United Company RUSAL, 2011, p. 7).

Italy stopped producing alumina in 2010. RUSAL continued with the suspension of operations at its Eurallumina facility in Italy owing to the high cost of running the facility. No production from the plant was reported in 2010 (United Company RUSAL, 2011, p. 34). In Italy, primary aluminum production decreased by 1.5% and secondary production increased to 1,200 t. Alcoa Inc. of the United States had idled its smelting operations in Italy at Fusima and Portovesme after a ruling by the EC in 2009, which stated that a portion of the benefit received by Alcoa from the Italian Government based on an electricity tariff must be refunded as it did not comply with EU state aid rules. Alcoa appealed the decision; however, the high cost of production was causing Alcoa to consider closing the Portovesme plant permanently (Alcoa Inc., 2009). These events had a major effect on Italian production, as the country's chief producers of alumina and primary aluminum were Rio Tinto-Alcoa Italia S.p.A. and Eurallumina S.p.A.

Romania's two alumina plants were the plant in Tulcea that was owned by Alum S.A. (part of the Vitmetco Group NV of the Netherlands) and the plant in Oradea that was owned by Cemtrade [a company owned by the Central European Aluminum Co. Group (CEAC), which was a managing agent for the En+ Group of Russia]. In late 2009, alumina production was restarted at the Alum plant, which had been closed for modernization in 2007. The plant produced an estimated 450,000 t in 2010. The Cemtrade alumina plant at Oradea was still shut down in 2010 (it originally stopped production in late 2006), and CEAC announced that the plant was in the process of being divested from the group (Central European Aluminum Co., 2011; Vimetco N.V., 2011).

Many of the secondary aluminum producers in Austria had close ties with automobile manufacturers (including some in Germany), and it was estimated that a significant share of secondary aluminum production in the country relied on the automobile sector for both scrap aluminum feedstock and for sales of aluminum (Constantia Packaging AG, 2010, p. 33–37; Pawlek, 2010; AMAG Holding GmbH, 2011, p. 7, 36–37, 53; Norsk Hydro ASA, 2011, p. 4, 41–43).

France's output of primary aluminum increased by 3.1% in 2010, and secondary aluminum production in France increased by 33%. Rio Tinto Ltd. (Rio Tinto) was the country's sole producer of primary aluminum. Rio Tinto also operated facilities for the production of alumina and aluminum semimanufactures. In 2010, production of specialty alumina continued at the Gardanne specialty alumina plant, even though at the end of 2008 Rio Tinto had closed the smelter-grade alumina operation in the same location (Rio Tinto Ltd., 2011).

Copper.—In 2010, Central Eurasia was the region's main producer of copper ore and the EU was the leading producer of refined copper, and production of both mined and refined copper was projected to increase slowly in the region. Russia's mine production of copper was projected to be 760,000 t by 2017, and its production of refined copper was projected to be 920,000 t

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by 2017. Kazakhstan's mine production of copper was projected to be 520,000 t by 2017, and production of refined copper was projected to be 530,000 t (tables 7, 8).

Russia and Kazakhstan (in order of the volume produced) accounted for the majority of copper ore production in 2010 (703,000 t and 380,000 t, respectively). The 703,000 t of mined copper that Russia produced was a 4% increase compared with the level of production in 2009. The two main copper producers in Russia were OAO Ural GMK and OAO GMK Norilsk Nickel, which together produced about 80% of the country's copper ore. About 60% of all copper was produced from deposits in the Norilsk ore province (located in the Taimyr municipality of Krasnoyarskiy Kray). Other places where copper deposits occur are the Murmansk region in the north and the Middle and Southern Urals. Russia was a significant producer of primary and secondary refined copper, producing 20.1% of the total world output. Russia produced 874,000 t in 2010, which was a 1.4% increase from that of 2009. Internal copper consumption in Russia reached 3.12 kilograms per capita. The cable industry was a major copper consumer in Russia and accounted for 55% to 60% of the copper market (tables 7, 8).

Kazakhmys plc was the dominant producer of copper ore and metals in Kazakhstan, and in 2010, the company operated 17 mines, 10 concentrating plants, and 2 smelting and refinery plants. The company produced 335,000 t of copper contained in concentrate and 306,000 t of refined copper cathodes, which accounted for about 88% of the copper in concentrate and 95% of the refined copper produced in Kazakhstan in 2010. The average copper grade of crude ore produced by Kazakhmys decreased to 1.09% from 1.18% in 2009, resulting in a 6% decrease in the copper content of ore production despite a 2% increase in crude ore production. Ore grades were expected to continue to decrease, but Kazakhmys planned to partially offset this decrease by increasing crude ore production volumes. Kazakhstan was a significant producer of primary and secondary refined copper, producing 25.9% of the total world output (tables 7, 8; Kazakhmys plc, 2011, p. 20).

In Bulgaria in December 2010, Dundee Precious Metals Inc. of Canada (Dundee) and Unicredit Bulbank announced a long-term $66.75 million loan agreement with the European Bank for Reconstruction and Development. The proceeds of the loan would be used mostly to finance the company's $150 million Chelopech Mine and mill expansion. The expansion was expected to double the production of both the mine and the mill to approximately 2 million metric tons per year (Mt/yr) at a grade of .5% to .7%. The construction project was scheduled to be finished at the end of 2011 (Dundee Precious Metals Inc., 2010).

KGHM Polska Miedz S.A. was the only copper mining and primary copper metal producing firm in Poland and was a significant world producer of copper and silver. The company accounted for about 3% of world copper mine and refined copper production (combined) and about 4% of world mine production of silver. The company planned to expand its resource base and increase the production of copper in concentrate to about 700,000 metric tons per year (t/yr) from the 481,000 t of copper in concentrate produced in 2010. The increased production capacity would come mainly from imported ores and further investments planned for exploration and mining within Poland to maintain current levels of production (Galos, Ney, and Smakowski, 2010, p. 161; KGHM Polska Miedz S.A., 2011, p. 106, 108, 112, 136–137).

Uzbekistan produced 90,000 t of mined and refined copper in 2010. The main copper producer in Uzbekistan was Almalyk GMK, which was located in the Tashkent region. The company had mining, beneficiation, and metallurgical facilities. Copper ore was mined from the Kalmakyr and the Sary-Cheku deposits; a new deposit, Dalnee, that is similar in ore structure to Kalmakyr was to serve as a replacement as the first two deposits become depleted. In 2010, Almalyk completed construction of a new beneficiation plant for copper, lead, and zinc ores.

Gold.—In 2010, Europe and Central Eurasia accounted for about 16% of world gold production; the majority of gold production in the region came from Central Eurasia. The principal producers, by volume, were Russia, which produced about 189,000 kilograms (kg), followed by Uzbekistan (90,000 kg) and Kazakhstan (30,272 kg).

In June, Euromax Resources Ltd. of Canada announced that drilling at its project in Breznik, Bulgaria, had extended the strike of the high-grade gold-silver deposit by 120%, from nearly 1,000 meters (m) to 2,200 m. The company also reported that drilling reports identified a parallel gold-silver deposit and a gold-copper deposit that had not previously been identified (Euromax Resources Ltd., 2010).

Kazakhstan was not a leading world producer of gold, but in 2010, the President of Kazakhstan announced that Kazakhstan planned to more than double gold production to about 70 t/yr by 2017 (Thomson Reuters, 2010). In 2010, Kazakhstan reported 30,272 kg of gold mine output. The likelihood of Kazakhstan reaching that production target was unknown, but a number of development projects were underway, and production could significantly increase.

The leading producers of gold in Kazakhstan were Kazzinc JSC and Kazakhmys, which accounted for 33% and 18%, respectively, of Kazakhstan's total gold production in 2010. The companies' development outlooks for gold production were not known, but gold production at Kazakhmys was likely to decrease by about 1,300 kg because the Mizek Mine stopped production in 2010 and the Mukur Mine was expected to do the same in 2012. Kazakhmys' substantial Bozshakol copper development project was reported to contain gold and could be an important new source of production.

JSC Altyntau Resources planned to reach full production capacity of 22,000 kilograms per year (kg/yr) in April 2011 (Novosti-Kazakhstan, 2011). KazakhGold Group Ltd.'s base-case development plan for 2010–20 called for capital investments of $512 million and production of about 16,000 kg/yr of gold by 2016 (KazakhGold Group Ltd., 2010). In 2010, Nord Gold N.V. made investments at its Suzdal Mine that were expected to enable the mine to increase its annual production levels to about 3,100 kg from the 2,300 kg it produced in 2010 (Nord Gold N.V., 2011, p. 28).

Hambledon Mining plc's Sekisovskoye underground mine could increase production to about 850,000 t/yr of mined ore when its underground mine is fully operational in

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either 2013 or 2014. Based on 2010 production, this would allow Hambledon to produce about 1,000 kg/yr of gold (Hambledon Mining plc, 2011, p. 3–5). Central Asia Resources Ltd. expected to begin production at the Dalabai deposit in 2011 and planned to develop the Altyntas deposit in 2012. The Dalabai project was expected to produce about 620 kg/yr of gold (Central Asia Resources Ltd., 2011, p. 4, 12).

In December 2010, Gabriel Resources Ltd. of Canada won a court challenge in the Romanian courts that validated its right to develop the Rosia Montana gold project in northwestern Romania; the company's permits had been challenged by groups opposing the development. Development of the project was put on hold when the technical review of the company's environmental impact assessment (EIA) by the Ministry of Environment was suspended in September 2007; development was restarted in late 2010. Gabriel Resources reported proved reserves of 5.9 million troy ounces (184 t) of gold and 32.6 million troy ounces (1,014 t) of silver, and probable reserves of 4.2 million troy ounces (131 t) of gold and 15 million troy ounces (467 t) of silver. The company estimated that the project could produce an average of 15,894 kg/yr of gold during a 16-year mine life and could make Romania a significant European gold producer (Corser and others, 2009, p. 3; Gabriel Resources Ltd., 2010, 2011).

In 2010, Russia produced 189 t of primary gold and 12.6 t of secondary gold. Overall production of gold decreased by 2% compared with the level in 2009. The leading gold-producing regions in 2010 were Krasnoyarskiy Kray (36 t), Chukotka (24.9 t), Amurskaya Oblast' (19.9 t), and Yakutia (18.6 t). The leading producers in 2010 were OAO Polyus Zoloto (40.0 t), ZAO Chukotskaya GGK (19.9 t), ZAO GK Petropavlovsk (13.9 t), and OAO Polymetall (11.1 t). Gold prices had increased markedly in the past decade from an average of $271 per troy ounce in 2001 to an average of $1,224 per troy ounce in 2010. Given this price increase, the Union of Gold Producers of Russia put forward a proposed list of laws and regulations to prevent further increases in gold production and a set of measures to be taken. The proposed changes included simplifying the procedure for obtaining gold exploration licenses, allowing regions to issue licenses for exploration and mining from deposits under 10 t, eliminating taxes on gold mining from alluvial and technological deposits, and adopting the Federal program for development of the gold mining industry. The union said that a realistic goal would be an increase in gold production to 300 t/yr (Braiko and Ivanov, 2011; Rough and Polished, 2011; Zolotonews.ru, 2012).

In 2010, Uzbekistan produced an estimated 90 t of gold. The main gold producer in Uzbekistan was Navoi GMK, which was responsible for more than 80% of Uzbekistan's gold production. The resource base of Navoi GMK included 13 deposits that comprise about 85% of all explored gold reserves of Uzbekistan. The largest deposit, Muruntau (located in the central Kuzulkum region), contained gold quartz ores and was mined by open pit method. The Zamitan gold extraction complex within the Navoi GMK mined the Charmitan, the Gughumsai, the Karakutan, the Marjanbulak, and the Promeshutochnoe deposits of the Samarkand gold ore region. Navoi GMK was one of the few mining complexes in the world that had a complete cycle of gold production, from exploration to jewelry production and sale. Navoi GMK included four metallurgical plants in Navoi, Uchkuduk, Zarafzhan, and Zarmitan; a mechanical engineering plant, a jewelry-making plant, and several research laboratories. Other gold producers in Uzbekistan included the Almalyk Mining and Metallurgical Complex and the Amantaytau Goldfields, which was a joint venture with Oxus Gold PLC.

The number of licenses for exploration and development of gold mines in the United Kingdom decreased from 32 to 24 in 2009 (the latest year for which information was available) because eight licenses were relinquished in Northern Ireland, although the number of leases remained constant at four. Exploration continued at Cononish in Scotland, and in Omagh and Armagh in Northern Ireland. In Scotland, Scotgold Resources plc had licenses from Mines Royal for the areas around Glen Lyon, Glen Orchy, and Inverliever and owned the gold and silver assets of the Cononish deposit near Tyndrum.

In Northern Ireland, the Omagh (formerly Cavanacaw) deposit, which is located 10 kilometers (km) southwest of Omagh, was owned by Omagh Minerals Ltd., which was a wholly owned subsidiary of Galantas Gold Corp. The main deposit had an indicated reserve of 350,000 t grading 6.74 grams per metric ton gold. Galantas had been granted exploration licenses to the west and north of its existing license and now held licenses for an area totaling 460 square kilometers.

Conroy Diamonds and Gold plc was exploring in the Clontibret district. The district is located on the border of Northern Ireland and the Republic of Ireland near Monahan (British Geological Survey, 2011, p. 49–50).

Russia's production of gold is projected to increase to 210,000 kg by 2017, and that of Kazakhstan is projected to increase to 70,000 kg by 2017. Russia and Kazakhstan are the principal producers of gold in the Europe and Central Eurasia region, and they are projected to remain so for the foreseeable future (table 17).

Iron and Steel.—Europe and Central Eurasia produced about 19.8% of the world's crude steel output and 16.2% of the pig iron and direct-reduced iron output in 2010. Russia was the leading individual producer of steel, with 66.3 Mt, followed by Germany (43.8 Mt), Ukraine (33.6 Mt), and Italy (25.8 Mt).

Voestalpine AG was by far the leading producer of crude steel in Austria and the 10th ranked in Europe and Central Eurasia. In April, the company considered increasing the percentage of domestically produced iron ore in the volume of raw material used to manufacture crude steel in the country from about 25% to about 30% because the average price of iron ore purchased by Voestalpine reportedly increased by about 70% during the month of April. In 2010, Austria's production of iron ore increased by about 3% compared with that of 2009, the country's imports of iron ore and concentrates increased by about 53% (by 3.2 Mt), and its exports of iron ore and concentrates were a negligible percentage of production (amounting to only 22 t in 2009 and 9 t in 2010). Austria's production of crude steel increased by about 27% during this same timeframe. During 2010, Voestalpine considered construction of a pellet plant to increase the output of marketable iron ore at the company's Erzberg Mine, but it decided in November that the project was not feasible primarily owing to the expected high costs of the emissions permits

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that would be necessary to operate the new plant. Sales to the automotive sector accounted for the leading share (about 28%) of total revenues for Voestalpine, including about 31% of the revenues of the company's steel division (Schneeweiss, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 31–32, 68; Voestalpine AG, 2011, p. 3, 24–27, 39, 52–58).

In Bulgaria, Stomana Industry S.A., which was a subsidiary of Sidenor S.A. of Greece, announced in November a proposed investment of more than $35 million by the International Finance Corp. of the World Bank Group. This investment would help fund part of a new capital investment project that would include the construction of a new electric arc furnace (EAF). This investment and the development of the refinancing project were intended to revitalize the company and provide environmental and financial benefits in the long term (Stomana Industry S.A., 2010).

France's output of pig iron increased by 25% to 10.1 Mt, which reversed a trend of decreased production. Crude steel production increased by 20% to 15.4 Mt, also reversing a similar trend of decreased production. Crude steel consumption increased by 25.6% to slightly more than 3.16 Mt (World Steel Association, 2011, p. 88).

In 2010, Italy's pig iron production increased by about 50.3% compared with output in 2009 to 8.56 Mt, and the production of crude steel increased by about 29.7% to 25.8 Mt, which was a contrast to Italy's highest ever production levels of 32 Mt achieved in 2007. Italy's apparent consumption of crude steel increased to 26.6 Mt and ranked the country second in the EU after Germany (World Steel Association, 2011, p. 88).

Poland had not produced iron ore since 1990 and was dependent on imported iron ore and concentrates for domestic pig iron production. In 2010, Poland imported about 6.5 Mt of iron ores and concentrates, which was a 71% increase in imports compared with those of 2009 (3.8 Mt), when production of pig iron was exceptionally low owing to lower demand for steel as a result of the world economic crisis. About 82% of these imports came from Ukraine and about 16% came from Russia. All the imported iron ore and concentrates were used for pig iron production at ArcelorMittal Poland S.A.'s iron and steel plants at Dabrowa Gornicza and Krakow (Central Statistical Office of Poland, 2010b, 2011b; Galos, Ney, and Smakowski, 2010, p. 271–273).

Crude steel production increased by 12% as economic conditions within Poland and in the rest of Europe improved and resulted in higher levels of steel consumption in 2010 compared with those of 2009. In the past 5 years, crude steel production in Poland followed general economic trends, with peak production in 2007 (10.6 Mt), a reduction in 2008 (9.7 Mt) as the world economic crisis began, and the lowest amount of production in 2009 (7.1 Mt) during the worst year of the economic crisis followed by signs of recovery in 2010. According to the Polish Steel Association, Polish apparent consumption of finished steel products in 2010 was 9.82 Mt, which was about a 20% increase compared with that of 2009, and Polish exports of steel products increased by 5% to 4.2 Mt. Employment in the steel industry decreased by 3.1% compared with that of 2009 to 25,475 people (Polish Steel Association, 2010, p. 24–26).

According to the World Steel Association, Ukraine was the world's eighth ranked producer of steel and the fourth ranked exporter, following Japan, the EU, and Russia. In 2010, Ukraine exported about 24 Mt of steel, which was about 72% of the country's total steel production. Metinvest was the leading producer of crude steel in Ukraine and accounted for 41% of production (including total 2010 production at OJSC Ilyich Iron and Steel Works, which was acquired by Metinvest in November 2010). The iron and steel industry in Ukraine had the advantage of large domestic sources of iron ore but was dependent on export markets for product sales and it operated inefficiently owing to a need for technical investment (Metall Ukrainy, 2011, p. 6; Metinvest B.V., 2011, p. 17; World Steel Association, 2011, p. 9, 25).

In 2010, Ukraine produced 69% of its steel in oxygen converter furnaces, 26% in open hearth furnaces, and 5% in EAFs. Production of steel using open hearth furnaces is energy inefficient compared with oxygen converter or EAF production and takes place only in a few other countries, including Russia and India, which produced only 9.8% and 1.7%, respectively, of their steel in open hearth furnaces in 2010. In Ukraine, only 54% of steel in 2010 was produced through continuous casting, which was the lowest percentage of any country in the world (World Steel Association, 2011, p. 10–11).

Steel production in Europe and Central Eurasia was expected to increase by an estimated 13% by 2017. The largest increases in production were expected from Ukraine, 43%; the United Kingdom, 34%; Poland, 25%; Italy, 17%; and France, 17%. The expected increase in production capacity in Ukraine and the reemployment of existing capacity in the other countries as a response to increased demand are seen as the main reasons for the projected increase in production (table 10).

Iron Ore.—Europe and Central Eurasia produced 10.6% of the world's iron ore in 2010. Central Eurasia was the dominant producer of iron ore in the region. Kazakhstan, Russia, Sweden, and Ukraine were the region's leading iron ore producers in the region, accounting for a combined production of 132 Mt in 2010. Kazakhstan's production is expected to increase by 23% by 2017 and that of Ukraine by 16% (table 9).

Lead and Zinc.—Europe and Central Eurasia produced about 12% of the world's production of mine output of zinc and about 20.4% of world zinc metal output in 2010. Kazakhstan and Ireland were the leading producers of zinc ore and produced 404,500 t and 342,500 t, respectively. Spain, Belgium, Kazakhstan, and Finland were the principal producers of refined zinc in Europe and Central Eurasia.

In Ireland, Galmoy Mines Ltd. (a subsidiary of Lundin Mining Corp.) recommenced operations at the Galmoy Mine in early 2010. The mine had stopped operations in June 2009 owing to the collapse in base-metal prices in the preceding years (Exploration and Mining Division, 2011, p. 1).

Boliden Tara Mine Ltd.'s Navan operation in Co. Meath, Ireland continued to be the leading zinc mine in Europe. In 2010, it milled about 2.6 Mt of ore to produce 167,334 t of zinc. The mine's Joint Ore Reserves Committee (JORC)-classified ore reserves (proven and probable) were 16 Mt grading 7.1% zinc and 1.8% lead (Exploration and Mining Division, 2011, p. 1).

In Poland, the shutdown of Zaklady Gorniczo "Trzebionka" S.A. was the main reason for the significant decrease in lead

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and zinc mine output in 2010. Mining of lead and zinc ore at the ZGH "Boleslaw" Mine at Olkusz and Pomorzany was expected to end in 2013, although mining activities could continue for an additional 20 years if new reserves are successfully developed. ZGH "Boleslaw" S.A. began discussions about a merger with Huta Cynku Miasteczko Slaskie (HCM) S.A. (a producer of lead and zinc metal) and planned to take over HCM S.A. (Galos, 2009, p. 25; Metal Bulletin, 2009, p. 10; Galos, Ney, and Smakowski, 2010, p. 293–294, 526).

Russia possesses 17% of the world's zinc reserves (about 45 Mt) and has two large zinc deposits (the Kholodninskoe and the Ozyornoe), which are located in the Republic of Buryatiya. In Russia, more than 60% of the zinc produced was used for the production of galvanized steel, mainly for the automobile and construction industries.

Nickel.—Production of the region's mine output of nickel was almost entirely the result of Russian mining activity, and refined nickel production took place mainly in Russia and Western Europe. Russia accounted for about 84.6% of nickel mine output and 56.6% of nickel refinery production in the region in 2010.

Finland's Talvivaara nickel deposit was the largest nickel deposit in Western Europe; it was composed of two polymetallic deposits—the Kolmisoppi and the Kuusilampi—which are located about 30 km from Sotkamo. Based on estimated proven reserves, the deposit was considered to have resources to produce about 2.5% of the world's nickel during its scheduled 24-year operating life. Talvivaara's bioheap-leach project was planned to produce nickel from an open pit operation and cobalt, copper, and zinc as byproducts. The planned nickel production of 50,000 t/yr was anticipated to be reached in 2012 (Mining Technology, 2008). The Kevitsa nickel deposit, which is located in northern Finland, was one of the world's major undeveloped nickel sulfide deposits.

Alba Mineral Resources plc relinquished its four exploration licenses in the Aberfeldy area in the United Kingdom. This area covers Arthrath, Kilmelford, and part of the Ochil Hills (British Geological Survey, 2011, p. 73).

Platinum-Group Metals.—Within the region of Europe and Central Eurasia, almost all mining for platinum-group metals (PGMs) took place in Russia, although small amounts of PGM were also mined in Finland, Poland, and Serbia. Russia and South Africa were the world's leading PGM ore producers; Russia was the world's leading producer of palladium, producing an estimated 84,700 kg, which accounted for 42.6% of the world's production. It also produced an estimated 25,000 kg of platinum.

PGMs have important applications in the industrial sector. Palladium and platinum and, to a lesser extent, rhodium are critical components of catalytic converters, which control automobile emissions, and platinum is the critical catalytic element in the proton exchange membrane (PEM) fuel cell under development to power automobiles. PGMs are expected to be in much greater demand as the world's automobile fleet increases and is equipped with catalytic converters. As legislation calling for stricter automobile emissions controls is enacted, greater loadings of PGM in catalytic converters will likely be required. Also, the need for alternative sources of energy to petroleum could result in the development of a hydrogen-based economy powered by fuel cells that use platinum as a catalyst. Russia's production of PGMs is expected to remain stable from 2010 to 2017 (tables 11, 12).

Industrial Minerals

Diamond.—Russia was the world's leading diamond producer and the only significant diamond mining country in Europe and Central Eurasia. Almost all Russia's output of diamond was mined by the Russian company Joint Stock Company ALROSA (ALROSA) which had its main operation in the Sakha (Yakutiya) Republic in East Siberia. ALROSA was one of the world's leading companies in the field of diamond exploration, diamond mining, sales of rough diamond, and diamond processing, and the company accounted for 97% of Russia's diamond production. Russia's share of global natural, gemstone and industrial diamond production was 25.9% in 2010. Russia's production of diamond is expected to be stable from 2010 to 2017 (tables 4, 13).

Rare Earths.—In Estonia, Silmet AS began production of rare-earth metals in 1970. The company had a production capacity of up to 3,000 t/yr of rare-earth products and 700 t/yr of rare-metal products. All rare-earth raw materials were imported. The company produced cerium, lanthanum, neodymium, praseodymium, and samarium-europium-gadolinium products as well as niobium and tantalum chips, hydrides, metal ingots, and metallic powders. In April 2011, Molycorp Minerals LLC (a subsidiary of Molycorp Inc.) purchased a 90.023% share of Silmet for about $89 million (Molycorp, Inc., 2011; Silmet AS, 2012a–d).

No rare-earth metals were produced in Kazakhstan in 2010, but the Government of Kazakhstan supported the development of rare-earth projects through joint ventures with foreign companies. In 2010, Kazatomprom signed agreements to establish joint ventures focusing on the production of rare metals and rare-earth metals with two Japanese companies. An agreement with Sumitomo Corp. was signed in March to establish Summit Atom Rare Earth Co. (SARECO), and in June, an agreement was signed with Toshiba Corp. to establish a joint venture. These projects were in the very early stages of development, and at the end of 2010, no information was available about when production could potentially begin (Kazatomprom JSC, 2010a, b).

The only deposit in Russia that was currently producing rare-earth metals was the Lovozero loparite deposit in the Murmansk region. The ores of the Lovozero deposit contain predominantly rare-earth metals from the cerium group (about 1.12% average rare-earth content). The beneficiation of ores and the production of complex concentrates (titanium-tantalum-niobium) was conducted by OOO Lovozerskiy Mining and Beneficiation Complex in close proximity to the extraction site. Although official data were not available, the 2010 annual production is estimated to have been about 3,600 t of rare-earth oxides. Russia had the second largest amount of rare-earth resources after China and had 115 discovered deposits of rare-earth ores. Among them was the Tomtor deposit, which is located on the northeast of Sakha (Yakutiya) Republic. It contains between 8% and 12% rare-earth oxides, with a 0.5%

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concentration of yttrium trioxide. In 2010, the deposit had not been developed because of the area's severe climate and insufficient infrastructure.

Mineral Fuels and Related Materials

Coal.—In 2010, Europe and Central Eurasia accounted for 53.5% of the world's lignite production, 9.6% of the world's bituminous coal production, and 4.2% of the world's anthracite production. In Central Eurasia, Kazakhstan, Russia, and Ukraine were the leading coal producers, and within the EU, Germany and Poland were the leading coal producers. A number of other countries throughout the region also mined coal (tables 4, 14).

Russia ranked fifth in the world in the total volume of coal mined following China, the United States, India, and Australia. In every year since 1999, the country had experienced growth in coal output. During that time, domestic coal consumption remained at about the same level from year to year, and consumption of coal for energy generation decreased, in part because of warmer winters in Russia and larger volumes of water in rivers and reservoirs, which increased hydroelectric output.

Ukraine was among the world's leading coal mining countries. Ukraine's energy strategy, which was approved by the Government in 2006, called for increasing coal output to 130.3 Mt by 2030. The country's economic (balansovye) reserves as of January 1, 2005 (calculated according to the reserve classification system used during the Soviet period and later by many of its successor states) were reportedly about 8.7 billion metric tons (Gt), of which 6.5 Gt was classified as industrial reserves. Metallurgical coal made up 54% of total industrial reserves, and steam coal reserves accounted for 46%. Production was more than 20% below domestic consumption. Explored reserves in Ukraine were reportedly 117 Gt.

As of the end of 2009, Poland had bituminous coal reserves of about 16.6 Gt and proved reserves of about 4.4 Gt and was the leading producer of bituminous coal in the EU. Reserves were not expected to be expanded owing to environmental concerns, difficult geologic conditions, and the low quality of the coal. Poland was among the world's 10 leading producers of brown coal and lignite, and as of the end of 2009, reserves were about 14.9 Gt and proved reserves were about 1.4 Gt. Coal was Poland's major mineral fuel and, in 2010, coal and lignite accounted for 87% of electricity production. In 2009 (the latest year for which data were available), bituminous coal and lignite made up 66% and 19%, respectively, of Poland's energy balance (Central Statistical Office of Poland, 2010a, p. 27, 58–59, 2011a, p. 48; Galos, Ney, and Smakowski, 2010, p. 253, 303; European Association for Coal and Lignite, 2011).

Given its lack of significant petroleum and natural gas resources, the Government of Poland considered coal to be one of the most important components of the country's energy security and sought to promote "the efficient and effective management of coal deposits." The Energy Policy of Poland Until 2030 (released in 2009) emphasized the importance of coal and predicted that it would remain the most important domestically produced mineral fuel for the foreseeable future. The report forecast that in 2010, electricity generated from bituminous coal and lignite would make up 53% and 35%, respectively, of total electricity generation, and by 2030, electricity from these sources would make up 36% and 21%, respectively, of total electricity generation. The report also estimated that bituminous coal and lignite would make up 31% and 8%, respectively, of Poland's primary energy demand in 2030. To ensure that the coal and lignite resources of Poland would be used efficiently, the Government planned to increase geologic research in coal and lignite, abolish legal barriers to the development of coal and lignite deposits, include coal deposits in land development plans to ensure that access to coal and lignite deposits would not be blocked, and adopt other measures to encourage future coal and lignite production (Ministry of Economy of the Republic of Poland, 2009a, p. 9–10; 2009b, p. 15–16).

The use of coal as a cheap source of fuel to generate significant amounts of electricity in Poland through 2030 could be inhibited by EU regulations that require reductions in carbon dioxide emissions. Reducing the use of coal as a cheap source of energy would be difficult economically, and the Polish Government was considering ways to limit reductions to coal-based electricity production. In April, the EC approved Poland's national allocation plan for distributing carbon dioxide emission allowances for 2008 through 2012. In 2007, the EC rejected the original plan submitted by the Polish Government because it proposed 285 Mt of emission allowances be distributed. The new plan that was approved allocated 208.5 Mt of allowances (EUobserver.com, 2010).

Coal production in the United Kingdom increased slightly in 2010, making it 3 years in a row that an increase in production had been achieved against the long-term trend of production decreases. In 2009 (the latest year for which data were available), Coal Authority licenses for opencast sites in production totaled 35 and included 19 in Scotland, 9 in England, and 7 in Wales. Scottish Coal Co. Ltd. was the leading open cast coal mining company in the United Kingdom and the second ranked net coal producer (British Geological Survey, 2011, p. 33). The generation of electricity accounted for the majority of the country's total coal consumption. About one-third of all electricity generated in the United Kingdom was supplied by coal (British Geological Survey, 2011, p. 33).

Between 2010 and 2017, coal production is expected to increase in Kazakhstan and in Ukraine by almost 20%. Coal production in Russia is expected to increase by 4%.

Natural Gas and Petroleum.—Oil production in the area of Central Eurasia was of major significance to the world's oil supply. Russia was a significant oil producer and a top exporting nation. Azerbaijan was engaged in major oil development projects offshore in the Caspian Sea, and Kazakhstan was engaged in major projects both onshore and offshore. Denmark-Greenland, Norway, and the United Kingdom were significant regional oil producers; however, the North Sea holds Europe's largest natural gas and petroleum reserves.

Russia was the world's second ranked natural gas producer and leading exporter; it had the world's largest natural gas reserves, with 44.8 trillion cubic meters of reserves, which was about 24% of total world natural gas reserves and about 1.5 times larger than the size of the reserves of Iran, which had the second largest reserves. A large number of countries in the

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region of Europe and Central Eurasia produced natural gas, but generally not in large amounts. Norway, the United Kingdom, and the Netherlands, in order of volume, were significant regional producers of natural gas in Europe, and Turkmenistan and Uzbekistan were notable regional natural gas producers in the CIS (BP p.l.c., 2011, p. 22).

According to industry journals, estimates of Azerbaijan's proven crude oil reserves range between 7 and 13 billion barrels (Gbbl) (about 950 Mt to 1.77 Gt). The State Oil Company of the Azerbaijan Republic (SOCAR) estimated the country's proven oil reserves to be 925 Mt. Azerbaijan had signed more than 20 major agreements to develop oilfields with about 30 companies from 15 countries. Plans for 2008 to 2015 called for engaging in 110,000 m of exploratory drilling. Implementation of SOCAR's program for full-scale development of AGC deposits, along with the possibility of developing new oil and gas condensate deposits in the offshore part of the Azerbaijan sector of the Caspian Sea, provided the basis for SOCAR to project that between 2010 and 2015, oil production could be from 66 to 67 Mt/yr.

Kazakhstan reportedly had the largest recoverable crude oil reserves in the Caspian Sea region and produced about one-half of the crude oil produced in this region. The country's oil reserves were estimated to be about 40 Gbbl (almost 2,000 Gt) (BP p.l.c., 2011, p. 6).

Oil production in Kazakhstan was expected to increase in the next decade primarily from the Tengiz field, where production was expected to double, and from the Kashagan offshore field, which could produce an additional 1 million barrels per day (Mbbl/d) after 2011. The Tengiz field, which had been developed since 1993 by the Tengizchevroil joint venture, was the country's leading oil producer; the field had recoverable crude oil reserves estimated by Chevron Corp. of the United States to be between 6 and 9 Gbbl (800 Mt and 1.2 Gt). The Kashagan field, which is located off the northern shore of the Caspian Sea near the Kazakh city of Atyrau, was the largest oilfield outside the Middle East and the fifth largest in the world (in terms of reserves). The field's recoverable reserves were estimated to be 13 Gbbl (1.77 Gt) of oil equivalent, with total reserves-in-place of about 38 Gbbl (5.2 Gt). The field could produce about 300,000 barrels per day (bbl/d) by late 2011 with full-scale commercial production expected to commence in 2013. Expected peak production from Kashagan was estimated to be about 1.3 Mbbl/d. The Kashagan field had presented particular challenges for its developers as it contains a high proportion of natural gas under very high pressure and also contains large quantities of sulfur. Offshore platforms must also withstand extreme weather fluctuations in the northern Caspian Sea. Additional oil production could originate from the Karachaganak oil and gas condensate field onshore in northern Kazakhstan near the border with Russia's Orenburg field. Karachaganak's oil reserves were estimated to be between 8 and 9 Gbbl (1.1 and 1.2 Gt) of oil and gas condensate (U.S. Energy Information Administration, 2010a, b).

The Government of the Netherlands planned to spend up to 1.8 billion euros ($2.3 billion) on new gas-network capacity over the next few years. Domestic natural gas production was declining, and expanding the transport network would enable the country's pipeline manager, Nederlandse Gasunie, to import more natural gas and export any surplus gas. It was expected that the proposed infrastructure would enable new suppliers to enter the market and create access to the LNG market. The LNG supply was expected to surge when N.V. Nederlandse Gasunie's Gate import terminal, which is located near The Hague and which was capable of converting between 8 billion and 12 billion cubic meters per year of liquefied natural gas (LNG) back into gas, began operating in 2010.

Norway had estimated proven reserves of 2.3 trillion cubic meters of natural gas as of January 2009. Norway's natural gas production had been increasing every year since 1994. The annual increases had been sustained by incorporating new fields in the Barents Sea and the Norwegian Sea. Norway's single largest natural gas field was the Troll-Oseberg field, which accounted for about one-third of Norway's natural gas production (U.S. Energy Information Administration, 2009a).

Norway, which has the largest petroleum reserves in Western Europe, was reported to have 6.7 Gbbl of estimated proven reserves as of January 2009. All the reserves are located offshore on the Norwegian Continental Shelf (NCS), which is divided into three sections: the Barents Sea, the North Sea, and the Norwegian Sea. The bulk of production took place in the North Sea, with smaller amounts in the Norwegian Sea. Norway produced about 2.13 Mbbl/d of petroleum in 2010 (table 4; U.S. Energy Information Administration, 2009b).

Eni Norge AS's Goliat field, which was to be the first petroleum discovery to be developed in the Barents Sea, was estimated to contain 174 Mbbl of petroleum. Eni Norge planned to bring the field online in 2013 and expected the field to produce for at least 15 years. The operation would include a floating production and storage facility. Eni Norge considered the Barents Sea to be a more long-term project for development than the other areas on the NCS, and Goliat would be the first field that Eni Norge would operate on the NCS. The Barents Sea North was not open for exploration (Norwegian Petroleum Directorate, 2009).

In 2010, there was a large amount of interest throughout the world in unconventional natural gas deposits because of relatively recent advancements in mining technology, such as horizontal drilling and hydraulic fracturing that made it possible to economically extract previously uneconomic resources. Poland was frequently mentioned as a potential future shale gas producer because of estimations of its significant shale gas reserves and its desire to reduce its reliance on Russian natural gas imports. A world assessment of shale gas resources commissioned by the U.S. Energy Information Administration (EIA) and conducted by Advanced Resources International, Inc., identified three basins (Baltic, Lublin, and Podlasie) in Poland as prospective shale gas areas and estimated that they contained 792 trillion cubic feet (22 trillion cubic meters) of shale gas in-place, which included 187 trillion cubic feet (5 trillion cubic meters) of technically recoverable gas. Technically recoverable gas refers to the estimate of the amount of gas in-place that could actually be recovered using current production technology, but did not take into account economic factors that could affect production. Poland accounted for about 31% of Europe's total shale gas in-place and 30% of total technically recoverable

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shale gas. The assessment's estimated amount of technically recoverable shale gas in Poland is equivalent to about 290 years of domestic consumption at current consumption rates, and indicated that, over the long run, shale gas could have a major effect on Poland's energy security (Galos, Ney, and Smakowski, 2010, p. 215; U.S. Energy Information Administration, 2011, p. 1-5, 7, V-1)

Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) reported that the Ministry of the Environment had awarded more than 70 exploration licenses for shale gas and tight gas deposits to more than 40 entities in recent years. Some of the companies conducting exploration activities included Lane Energy Poland Sp. z o.o. (a subsidiary of 3 Legs Resources plc.) in partnership with ConocoPhillips Co., BNK Petroleum Inc., Eni S.p.A. of Italy, Chevron Corp., Marathon Oil Corp., Exxon Mobil Corp., Aurelian Oil and Gas plc., and San Leon Energy plc., and PGNiG (Polskie Gornictwo Naftowe i Gazownictwo S.A., 2011, p. 33).

For the coming decade, Russian oil production was projected to grow at an annual rate of about 1.5% to 2.5%, owing in part to increased output from oil development on Sakhalin Island. This would be coupled with a slowdown in growth from the major mature oilfields in West Siberia, a number of which had passed peak production. New fields that were under development would produce almost all Russia's increase in annual oil output in the next 5 years and would probably produce more than one-half of the country's oil in 2020.

Almost 90% of Russia's natural gas was produced in the Ndym-Pur-Taz (NPT) region in northern West Siberia (the region's name was derived from the names of three rivers that border it). The NPT region hosts three massive Russian gasfields (the Medvezh'ye, the Urengoy, and the Yamburg), which had been the country's main producers and had supplied about 70% of the country's gas production. These three fields were in decline, however, as reserves were being depleted. To keep with the growth in the Russian economy and the country's long-term export commitments to Europe to increase gas output, Russia was expected to have to incur greater costs to develop fields further north and to the east in an even more difficult physical environment than in the NPT region. A main target for future development would be the Yamal Peninsula, where large reserves were discovered in several fields. The newly developed Zapolyarnoye field on the Yamal Peninsula was a major contributor to replacing decreasing production from large older fields where reserves were more than 50% depleted.

OAO Gazprom, which was Russia's leading gas producer, projected that between 2008 and 2030, it would increase natural gas output. Most of the increases in natural gas output were projected to come from independent gas companies, such as Itera, Northgaz, and Novatek, which although blocked from the export market, had found a niche supplying the domestic market.

In September 2010, in the United Kingdom, Egdon Resources Plc. received approval to redevelop the gasfield situated onshore in Kirkleathan, North Yorkshire (British Geological Survey, 2011, p. 75). Maersk Oil UK Ltd. began production in January at its Lochranza oilfield. The field had been developed by Maersk as the Dumbarton field in the United Kingdom's sector in the North Sea about 255 km northeast of Aberdeen, Scotland (British Geological Survey, 2011, p. 75).

The Buzzard oilfield in the outer Moray Firth was again the most prolific oilfield on the United Kingdom Continental Shelf (UKCS). At the end of 2009, the United Kingdom's estimated proven crude oil reserves totaled 3.6 Gbbl, which was the largest within the EU; the reserves were located mostly offshore on the UKCS. Most of the country's production had come from basins east of Scotland in the central North Sea. The northern North Sea, east of the Shetland Islands, also contains considerable reserves, and smaller deposits are located in the North Atlantic Ocean. Besides these offshore assets, the country had the Wytch Farm field, which was the largest onshore oilfield in Europe (U.S. Energy Information Administration, 2010c; British Geological Survey, 2011, p. 75).

Uranium.—In 2010, Central Eurasia accounted for more than 47.4% of the world's uranium production. Kazakhstan produced 20,995 t; Russia 4,200 t, and Uzbekistan 2,830 t. Uranium mining took place in several other countries in the region (the Czech Republic, Germany, and Ukraine), but in smaller quantities.

In 2010, Kazakhstan remained the leading producer of mined uranium; in 2009 Kazakhstan's production surpassed that of Canada, and Kazakhstan became the world's leading producer of uranium. Kazakhstan had no nuclear powerplants, and all uranium production was exported. Within the past 6 years Kazakhstan rapidly increased investment in its uranium industry, and the country's production of uranium increased from 3,300 t in 2003 to 17,803 t in 2010. Fixed capital investment in uranium and thorium mining increased from about $35 million in 2004 to about $309 million in 2009 (the latest year for which data were available). Foreign direct investment made up about 66% of uranium mining investment in 2009 (the latest year for which data were available) and was attracted through the establishment of joint ventures with the state-owned company Kazatomprom JSC. As of 2009, Kazakhstan had 651,000 t of known recoverable resources of uranium, giving it the second largest supply of uranium resources after Australia (Agency of Statistics of the Republic of Kazakhstan, 2009, p. 208; 2010, p. 102, 205; World Nuclear Association, 2010; 2011b).

On December 27, Uranium One Inc. of Canada acquired a 50% share of Akbastau JV and a 49.67% share of JV Zarechnoye JSC and received a cash payment of $610 million from the Russian holding company JSC Atomredmetzoloto (ARMZ) in exchange for Uranium One shares. After the completion of the transaction, ARMZ (a subsidiary of the State Atomic Energy Corporation Rosatom) owned 51.4% of Uranium One shares (Uranium One Inc., 2011, p. 15).

In 2010, Russia produced 4,200 t of uranium (U_3O_8 content). ARMZ was the major uranium producer in Russia, and its total uranium reserves were 726,500 t as of January 1, 2011. In 2008, most of the Russian mines engaged in uranium extraction as well as some enterprises located in CIS countries were consolidated by ARMZ. Altogether, ARMZ's enterprises employed more than 10,000 workers. ARMZ was 79.49% owned by Atomredmetzoloto OAO Atomenergoprom.

In Russia, the three main uranium producers were OAO Priargunsky Mining and Chemical Association (Zabaykalskiy Kray), ZAO Dalur (Kurganskaya Oblast'), and OAO Khiagda

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located in Buryatiya; all three were subsidiaries of ARMZ. Another large mine was under construction in Elkonsky Mining and Metallurgical Complex in western Sakha (Yakutiya) Republic. The expected annual capacity of the mine was 5,000 t/yr. The cost of uranium extraction at the Elkonsky Mine was predicted to be only about $80 per kilogram.

Ukraine's uranium reserves were estimated to be between 130,000 and 200,000 t, and the country was the ninth ranked producer of uranium in 2010. Nuclear powerplants in Ukraine accounted for 48% of all the electricity produced in the country, and domestic uranium production accounted for about 30% of all uranium used in Ukraine's nuclear powerplants. The remaining nuclear fuel required for Ukraine's nuclear powerplants was purchased from JSC TVEL (TVEL) of Russia, but Ukraine was examining ways to reduce its dependence on TVEL and was considering Westinghouse Electric Co. as a possible alternative source of nuclear fuel. In September, TVEL was awarded a contract for the construction of a nuclear fuel assembly plant in Ukraine; production was planned to begin in 2014 (Gavrish, 2010; JSC TVEL, 2010; World Nuclear Association, 2011a, c).

Ukraine's state-owned uranium miner (Vostochny GOK) expected total production of uranium in Ukraine to be about 1,000 t in 2011; slightly less in 2012–13 owing to reduced production from the Ingulskaya and Smolinskaya Mines; 2,100 t in 2014 owing to increased production at the Novokonstantinovskoye deposit, and from 2017 onward, about 3,500 t/yr. The level of production planned for 2017 would allow Ukraine to supply 100% of the uranium needs for domestic nuclear powerplants (RBK-Ukraine, 2010).

In Uzbekistan, the Navoi Mining and Metallurgical Complex held monopoly rights for the extraction and production of uranium. In 2010, Uzbekistan produced 2,830 t of uranium (U_3O_8 content). Several new mines were under construction at the Kukhnur and the Northern Kanimekh deposits. According to Uzbekistan's State Geology and Mineral Resources Committee (Goskomgeo), uranium extraction was expected to increase in the next few years as new mines start production. In 2009, Goskomgeo and the Chinese company CGNPC Uranium Resources Co. created a joint venture, Uz-China Uran, to explore for and develop uranium deposits in the Bostaus area. According to Goskomgeo, forecasted uranium resources in the area were in the order of 5,500 t.

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TABLE 1
EUROPE AND CENTRAL EURASIA: AREA AND POPULATION IN 2010

Country	Area[1] (square kilometers)	Estimated population[2] (thousands)
Albania	28,748	3,204
Armenia	29,743	3,092
Austria	83,871	8,384
Azerbaijan	86,600	9,048
Belarus	207,600	9,491
Belgium	30,528	10,879
Bosnia and Herzegovina	51,197	3,760
Bulgaria	110,879	7,543
Croatia	56,594	4,424
Cyprus	9,251	1,104
Czech Republic	78,867	10,525
Denmark, including Greenland	2,209,180	5,601
Estonia	45,228	1,340
Finland	338,145	5,364
France	551,500	64,877
Georgia	69,700	4,453
Germany	357,022	81,702
Greece	131,957	11,319
Hungary	93,028	10,009
Iceland	103,000	317
Ireland	70,273	4,481
Italy	301,340	60,484
Kazakhstan	2,724,900	16,316
Kosovo	10,887	1,815 [1]
Kyrgyzstan	199,951	5,365
Latvia	64,589	2,243
Lithuania	65,300	3,321
Luxembourg	2,586	506
Macedonia	25,713	2,061
Malta	316	413
Moldova	33,851	3,562
Montenegro	13,812	631
Netherlands	41,543	16,612
Norway	323,802	4,885
Poland	312,685	38,187
Portugal	92,090	10,643
Romania	238,391	21,442
Russia	17,098,242	141,750
Serbia	77,474	7,293 [1]
Slovakia	49,035	5,433
Slovenia	20,273	2,053
Spain	505,370	46,082
Sweden	450,295	9,379
Switzerland	41,277	7,825
Tajikistan	143,100	6,879
Turkmenistan	488,100	5,042
Ukraine	603,550	45,871
United Kingdom	243,610	62,219
Uzbekistan	447,400	28,160
Regional total	29,362,393	817,389
World total	148,940,000	6,840,507

[1]Source: U.S. Central Intelligence Agency, The World Factbook 2011.

[2]Source: The World Bank, 2011 World Development Indicators Database.

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TABLE 2

EUROPE AND CENTRAL EURASIA: GROSS DOMESTIC PRODUCT[1, 2]

Country	Gross domestic product based on purchasing power parity		Real gross domestic product growth rate (percentage)		
	Gross value (million dollars)	Per capita (dollars)	2008	2009	2010
Albania	23,912	7,468	7.5	3.3	3.5
Armenia	16,826	5,100	6.9	-14.2	2.1
Austria	333,537	39,761	2.2	-3.9	2.1
Azerbaijan	91,060	10,063	10.8	9.3	5.0
Belarus	131,535	13,874	10.2	0.2	7.6
Belgium	396,035	36,274	0.8	-2.7	2.1
Bosnia and Herzegovina	30,460	7,816	5.7	-2.9	0.7
Bulgaria	97,066	12,934	6.2	-5.5	0.2
Croatia	78,687	17,819	2.2	-6.0	-1.2
Cyprus	23,259	28,960	3.6	-1.7	1.0
Czech Republic	262,144	24,950	2.5	-4.1	2.3
Denmark, including Greenland	201,702	36,443	-1.1	-5.2	1.7
Estonia	24,762	18,527	-5.1	-13.9	3.1
Finland	187,696	34,918	1.0	-8.2	3.6
France	2,134,940	33,910	-0.2	-2.6	1.4
Georgia	22,510	5,074	2.4	-3.8	6.4
Germany	2,944,350	36,081	0.8	-5.1	3.6
Greece	318,670	28,496	1.0	-2.3	-4.4
Hungary	188,677	18,841	0.8	-6.7	1.2
Iceland	11,853	36,730	1.4	-6.9	-3.5
Ireland	176,555	39,492	-3.0	-7.0	-0.4
Italy	1,778,830	29,480	-1.3	-5.2	1.3
Kazakhstan	197,447	12,015	3.2	1.2	7.3
Kosovo	12,008	6,400 [3]	6.9	2.9	4.0
Kyrgyzstan	12,051	2,200	7.6	2.9	-1.4
Latvia	32,609	14,504	-4.2	-18.0	-0.3
Lithuania	56,750	17,235	2.9	-14.7	1.3
Luxembourg	41,271	81,466	1.4	-3.6	3.5
Macedonia	20,284	9,868	5.0	-0.9	1.8
Malta	10,423	24,833	5.4	-3.3	3.1
Moldova	11,019	3,092	7.8	-6.0	6.9
Montenegro	6,745	10,775	6.9	-5.7	1.1
Netherlands	680,772	40,973	1.8	-3.5	1.6
Norway	255,022	51,959	0.7	-1.7	0.3
Poland	723,032	18,981	5.1	1.6	3.8
Portugal	247,458	23,262	0.0	-2.5	1.3
Romania	254,918	11,895	7.3	-7.1	-1.3
Russia	2,230,950	15,612	5.2	-7.8	4.0
Serbia	75,828	10,252	3.8	-3.5	1.0
Slovakia	120,524	22,195	5.8	-4.8	4.0
Slovenia	56,663	28,073	3.7	-8.1	1.2
Spain	1,372,720	29,830	0.9	-3.7	-0.1
Sweden	356,321	38,204	-0.6	-5.3	5.7
Switzerland	326,741	41,950	2.1	-1.9	2.7
Tajikistan	14,788	1,924	7.9	3.9	6.5
Turkmenistan	37,012	6,805	14.7	6.1	9.2
Ukraine	306,638	6,698	1.9	-14.5	4.2
United Kingdom	2,181,460	35,059	-0.1	-4.9	1.4
Uzbekistan	86,103	3,048	9.0	8.1	8.5
Regional total	19,202,623	XX	XX	XX	XX

See footnotes at end of table.

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TABLE 2—Continued

EUROPE AND CENTRAL EURASIA: GROSS DOMESTIC PRODUCT[1,2]

Country	Gross domestic product based on purchasing power parity in 2010		Real gross domestic product growth rate (percentage)		
	Gross value (million dollars)	Per capita (dollars)	2008	2009	2010
World total	74,384,980	XX	2.8	-0.7	5.1

XX Not applicable.

[1]Source: International Monetary Fund, World Economic Outlook Database, September 2011.

[2]Gross domestic product listed may differ from that reported in individual country chapters owing to differences in source or date of reporting.

[3]Per capita GDP from the U.S. Central Intelligence Agency, The World Factbook 2011.

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TABLE 3
SELECTED EUROPE AND CENTRAL EURASIA EXPLORATION ACTIVITY IN 2010

Country	Site	Commodity[1]	Company	Phase[2]
Finland	Keivitsa	Ni, Cu, Au, Pt, Pd	First Quantum Minerals Ltd.	Feasibility.
Do.	Kittila (Suurikuusikko)	Au	Agnico-Eagle Mines Ltd.	Producer.
Do.	Kuusamo	Au	Dragon Mining Ltd.	Exploration.
Russia	Dvoinoye	Au	Kinross Gold Corp.	Producer.
Do.	Kupol	Au, Ag	do.	do.
Sweden	Tapuli (Kaunisvaara)	Iron ore	Northland Resources SA	Exploration.

Do., do. Ditto.

[1]Abbreviations used in this table for commodities are as follows: Ag, silver; Au, gold; Cu, copper; Ni, nickel; Pd, palladium; Pt, platinum.

[2]Phase of exploration activity has been separated into the following stages: Exploration, exploration prior to full feasibility study; Feasibility, feasibility study ongoing or completed; Producer, exploration at producing site.

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(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals								
	Aluminum				Antimony, mine output, metal content (metric tons)	Chromite, mine output, gross weight	Copper		
			Metal				Mine output, metal content	Metal, refined	
	Alumina	Bauxite	Primary[2]	Secondary				Primary[2]	Secondary
Europe and Central Eurasia:									
Albania[e]	--	--	--	--	--	290 [3]	3	--	--
Armenia	--	--	--	--	--	--	31	--	--
Austria	--	--	--	250 [e]	--	--	--	--	114 [p]
Azerbaijan	--	--	30 [e]	--	--	--	--	--	--
Belarus	--	--	--	--	--	--	--	--	--
Belgium[e]	--	--	--	(4)	--	--	--	370	--
Bosnia and Herzegovina	269	828	118	--	--	--	--	--	--
Bulgaria	--	--	--	12	--	--	105	215	--
Croatia	--	--	--	--	--	--	--	--	--
Cyprus	--	--	--	--	--	--	--	3	--
Czech Republic	--	--	--	45 [e]	--	--	--	--	--
Denmark-Greenland[e]	--	--	--	25	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--
Finland[e]	--	--	--	18	--	210	15	122 [3]	--
France	481 [e]	--	356	184	--	--	--	--	--
Georgia[e]	--	--	--	--	--	--	6 [e]	--	--
Germany	1,000 [e]	--	402	611	--	--	--	402 [p]	302 [p]
Greece[e]	725	2,000	130	3	--	1	--	--	--
Hungary	214	365	--	50 [e]	--	--	--	--	--
Iceland	--	--	813	--	--	--	--	--	--
Ireland	1,864	--	--	--	--	--	--	--	--
Italy	--	--	168	1,246	--	--	--	25 [e]	--
Kazakhstan	1,639	5,310	226	--	--	3,760 [e]	380	323	--
Kosovo	--	--	--	--	--	--	--	--	--
Kyrgyzstan[e]	--	--	--	--	10	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--
Macedonia	--	--	--	--	--	--	8 [e]	--	--
Malta	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--
Montenegro	--	61	82	--	--	--	--	--	--
Netherlands[e]	--	--	300	--	--	--	--	--	--

See footnotes at end of table.

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TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals								
	Aluminum				Antimony, mine output, metal content	Chromite, mine output, gross weight	Copper		
			Metal				Mine output, metal content	Metal, refined	
	Alumina	Bauxite	Primary[2]	Secondary	(metric tons)			Primary[2]	Secondary
Europe and Central Eurasia—Continued:									
Norway[e]	--	--	800	300	--	--	--	32	--
Poland	--	--	--	18 [e]	--	--	425	547	--
Portugal[p]	--	--	--	18 [e]	--	--	74	--	--
Romania	450 [e]	--	240 [e]	14	--	--	5 [e]	3	1 [e]
Russia	2,857	5,475	3,947	--	3,000 [e]	400	703 [e]	656	218
Serbia[e]	--	--	--	2	--	--	19	34	1
Slovakia[e]	--	--	163	--	--	--	--	--	--
Slovenia[e]	--	--	40 [3]	17	--	--	--	--	--
Spain[e]	1,500	--	408	243	--	--	5 [3]	255	35
Sweden[e]	--	--	93	25	--	--	77	210	25
Switzerland[e]	--	--	--	(4)	--	--	--	--	--
Tajikistan	--	--	349	--	2,000 [e]	--	--	--	--
Turkmenistan[e]	--	--	--	--	--	--	--	--	--
Ukraine[e]	1,534 [3]	--	25 [3]	130	--	--	--	--	20
United Kingdom	--	--	186	312	--	--	--	--	--
Uzbekistan[e]	--	--	--	3	--	--	90 [3]	90	--
Total, Europe and Central Eurasia	12,500	14,000	8,880	3,530	5,010 [e]	4,660	1,950	3,290	716
Share of world total	14.8%	6.5%	21.7%	39.7%	3.0%	19.4%	12.3%	20.1%	25.9%
United States	3,910	NA	1,730	--	--	--	1,110	1,060	38
Share of world total	4.6%	NA	4.2%	--	--	--	7.0%	6.5%	1.4%
World total	84,600	216,000	40,900	8,880	166,000	24,000	15,800	16,400	2,770

See footnotes at end of table.

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PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals—Continued								
		Iron and steel				Lead			
	Gold, mine output (kilograms)	Iron ore, mine output, metal content	Pig iron and direct-reduced iron	Steel, crude	Mine output, metal content	Metal, refined		Manganese ore, mine output, metal content	Mercury, mine output, metal content (metric tons)
						Primary[2]	Secondary		
Europe and Central Eurasia:									
Albania[e]	--	--	--	440	--	--	--	--	--
Armenia	2,000	--	--	--	--	--	--	--	--
Austria	--	662 [e]	5,621	7,206	--	--	25	--	--
Azerbaijan	--	33 [e]	--	129	--	--	--	--	--
Belarus	--	--	--	2,672	--	--	--	--	--
Belgium[e]	--	--	4,725 [3]	8,088 [3]	--	--	105	--	--
Bosnia and Herzegovina	--	588 [e]	621	593	3 [e]	--	(4) [e]	--	--
Bulgaria	4,400	--	--	740	13	81	--	11 [e]	--
Croatia	--	--	--	103	--	--	--	--	--
Cyprus	--	--	--	--	--	--	--	--	--
Czech Republic	--	--	3,987	5,180	--	--	30	--	--
Denmark-Greenland[e]	1,600	--	--	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	11	--	--
Finland[e]	1,800	--	2	4,023 [3]	--	--	--	--	6
France	1,500 [e]	--	10,137	15,414	--	--	82 [e]	--	--
Georgia[e]	2,000	--	--	--	(4)	--	--	116	--
Germany	--	41	29,010	43,830	--	125 [p]	280 [p]	--	--
Greece[e]	--	560	--	1,839 [3]	18	--	10	(4)	--
Hungary	--	--	1,325	1,678	--	--	--	5 [e]	--
Iceland	--	--	--	--	--	--	--	--	--
Ireland	--	--	--	--	39	--	19 [e]	--	--
Italy	--	--	8,555	25,750	1 [e]	15 [e]	134 [e]	--	--
Kazakhstan	30,272	13,800 [e]	2,984	4,256	36	103	--	640 [e]	--
Kosovo	--	--	--	--	5	4 [e]	--	--	--
Kyrgyzstan[e]	18,300	--	--	--	--	--	--	--	250
Latvia	--	--	--	550 [e]	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--
Luxembourg	--	--	--	2,563	--	--	--	--	--
Macedonia	--	--	--	292	46	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	242	--	--	--	--	--
Montenegro	--	--	--	95 [e]	--	--	--	--	--
Netherlands[e]	--	--	5,799 [3]	6,651 [3]	--	--	17	--	--

See footnotes at end of table.

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TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Gold, mine output (kilograms)	Iron ore, mine output, metal content	Iron and steel: Pig iron and direct-reduced iron	Iron and steel: Steel, crude	Metals—Continued: Mine output, metal content	Lead: Metal, refined: Primary[2]	Lead: Metal, refined: Secondary	Manganese ore, mine output, metal content	Mercury, mine output, metal content (metric tons)
Europe and Central Eurasia—Continued:									
Norway[e]	--	3,105 [3]	100	514 [3]	--	--	--	--	--
Poland	500 [e]	--	3,638	7,996	35 [e]	35 [e]	77 [e]	--	--
Portugal[p]	--	10 [e]	100 [e]	1,400 [e]	--	--	3 [e]	--	--
Romania	400 [e]	--	1,726	3,721	--	11	3 [e]	--	--
Russia	189,000	58,500	52,900	66,300	97 [e]	89 [e]	--	9 [e]	50 [e]
Serbia[e]	356	--	1,265 [3]	1,254 [3]	2	--	1	--	--
Slovakia[e]	534	130	3,649 [3]	4,580	--	--	--	--	--
Slovenia[e]	--	--	--	606 [3]	--	--	14	--	--
Spain[e]	3,400	--	4,200	16,311 [3]	--	--	125	--	--
Sweden[e]	6,300	16,750 [3]	3,800	4,844 [3]	68 [3]	56	40	--	--
Switzerland[e]	--	--	--	1,330 [3]	--	--	5	--	--
Tajikistan	2,049	--	--	--	1 [e]	--	--	--	(4) [e]
Turkmenistan[e]	--	--	--	--	--	--	--	--	--
Ukraine[e]	--	43,000	27,361 [3]	33,559 [3]	--	--	7	540	--
United Kingdom	--	--	7,233	9,709	(4) [e]	150 [e]	144 [e]	--	--
Uzbekistan[e]	90,000	--	--	745	--	--	--	--	--
Total, Europe and Central Eurasia	354,000	137,000	179,000	285,000	363	669	1,130	1,320	306
Share of world total	13.9%	10.6%	16.2%	19.9%	8.7%	14.7%	24.2%	9.1%	15.8%
United States	231,000	31,300	26,800	80,500	369	115	1,140	--	NA
Share of world total	9.0%	2.4%	2.4%	5.6%	8.8%	2.5%	24.3%	--	NA
World total	2,560,000	1,290,000	1,100,000	1,440,000	4,170	4,560	4,680	14,600	1,930

See footnotes at end of table.

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(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals—Continued								
	Nickel		Platinum-group metals, refined, primary and secondary (kilograms)		Silver, mine output, metal content (metric tons)	Tin (metric tons)		Titanium (metric tons)	
	Mine output, metal content	Refinery products, metal content	Palladium	Platinum		Mine output, metal content	Metal, primary[2]	Ilmenite, TiO_2 content	Metal sponge, metal content
Europe and Central Eurasia:									
Albania[e]	--	--	--	--	--	--	--	--	--
Armenia	--	--	--	--	68	--	--	--	--
Austria	--	1 [e]	--	--	--	--	--	--	--
Azerbaijan	--	--	--	--	--	--	--	--	--
Belarus	--	--	--	--	--	--	--	--	--
Belgium[e]	--	--	--	--	--	--	--	--	--
Bosnia and Herzegovina	--	--	--	--	--	--	--	--	--
Bulgaria	--	--	--	--	55 [e]	--	--	--	--
Croatia	--	--	--	--	--	--	--	--	--
Cyprus	--	--	--	--	--	--	--	--	--
Czech Republic	--	--	--	--	--	--	--	--	--
Denmark-Greenland[e]	--	--	--	--	--	--	--	--	--
Estonia	--	--	--	--	--	--	--	--	--
Finland[e]	19	41	--	275	60	--	--	--	--
France	--	14 [e]	--	--	--	--	--	--	--
Georgia[e]	--	--	--	--	1	--	--	--	--
Germany	--	--	--	110,000 [e]	--	--	--	--	--
Greece[e]	14 [3]	19	--	--	32	--	--	--	--
Hungary	--	--	--	--	--	--	--	--	--
Iceland	--	--	--	--	--	--	--	--	--
Ireland	--	--	--	--	4	--	--	--	--
Italy	--	--	--	--	--	--	--	--	--
Kazakhstan	1 [e]	--	--	--	552	--	--	15,000 [e]	14,500
Kosovo	9	7 [e]	--	--	--	--	--	--	--
Kyrgyzstan[e]	--	--	--	--	--	--	--	--	--
Latvia	--	--	--	--	--	--	--	--	--
Lithuania	--	--	--	--	--	--	--	--	--
Luxembourg	--	--	--	--	--	--	--	--	--
Macedonia	--	14 [e]	--	--	--	--	--	--	--
Malta	--	--	--	--	--	--	--	--	--
Moldova	--	--	--	--	--	--	--	--	--
Montenegro	--	--	--	--	--	--	--	--	--
Netherlands[e]	--	--	--	--	--	--	--	--	--

See footnotes at end of table.

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TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals—Continued								
	Nickel		Platinum-group metals, refined, primary and secondary (kilograms)		Silver, mine output, metal content (metric tons)	Tin (metric tons)		Titanium (metric tons)	
	Mine output, metal content	Refinery products, metal content	Palladium	Platinum		Mine output, metal content	Metal, primary[2]	Ilmenite, TiO_2 content	Metal sponge, metal content
Europe and Central Eurasia—Continued:									
Norway[e]	(4)	88	--	--	--	--	--	371,000	--
Poland	--	--	15 [e]	25 [e]	1,181	--	--	--	--
Portugal[p]	--	--	--	--	24	22	--	--	--
Romania	--	--	--	--	-- [e]	--	--	--	--
Russia	269	278	84,700 [e]	25,000 [e]	1,356	160 [e]	100 [e]	--	18,621
Serbia[e]	--	--	22	--	5 [3]	--	--	--	--
Slovakia[e]	--	--	--	--	--	--	--	--	--
Slovenia[e]	--	--	--	--	--	--	--	--	--
Spain[e]	6 [3]	--	--	--	3	--	--	--	--
Sweden[e]	--	(4)	--	--	302 [3]	--	--	--	--
Switzerland[e]	--	--	--	--	--	--	--	--	--
Tajikistan	--	--	--	--	3 [e]	--	--	--	--
Turkmenistan[e]	--	--	--	--	--	--	--	--	--
Ukraine[e]	--	12	--	--	--	--	--	295,000	7,400
United Kingdom	--	18 [e]	--	--	--	--	--	--	--
Uzbekistan[e]	--	--	--	--	59 [3]	--	--	--	--
Total, Europe and Central Eurasia	318	491	84,700	135,000	3,710	182	100	681,000	40,500
Share of world total	17.7%	35.4%	42.7%	44.9%	12.0%	0.1%	--	12.4%	42.4%
United States	--	--	11,600	3,450	1,280	--	--	219,000	--
Share of world total	--	--	5.9%	1.1%	4.1%	--	--	4.0%	--
World total	1,790	1,390	199,000	301,000	30,900	251,000	320,000	5,480,000	95,500

See footnotes at end of table.

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(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals—Continued			Industrial minerals					
	Tungsten, mine output, metal content (metric tons)	Zinc (metric tons)							
		Mine output, metal content	Metal, primary and secondary	Ammonia, N content	Cement, hydraulic	Diamond, natural, gemstones and industrial (thousand carats)	Phosphate rock, P_2O_5 content	Potash, K_2O equivalent	Salt
Europe and Central Eurasia:									
Albania[e]	--	--	--	--	1,300	--	--	--	25
Armenia	--	4,298	--	--	488	--	--	--	40 [e]
Austria	1,140 [e]	--	--	400 [e]	4,254	--	--	--	1,072
Azerbaijan	--	--	--	--	1,279	--	--	--	4
Belarus	--	--	--	836	4,531	--	--	5,223	1,700 [e]
Belgium[e]	--	--	320,000	830	8,300	--	--	--	--
Bosnia and Herzegovina	--	5,500 [e]	--	--	949	--	--	--	663
Bulgaria	--	10,700 [e]	88,000	320 [e]	3,000 [e]	--	--	--	1,300
Croatia	--	--	--	300 [e]	2,664	--	--	--	30 [e]
Cyprus	--	--	--	--	1,674	--	--	--	--
Czech Republic	--	--	--	200 [e]	3,500 [e]	--	--	--	--
Denmark-Greenland[e]	--	--	--	2	16,000	--	--	--	600
Estonia	--	--	--	50 [e]	375	--	--	--	--
Finland[e]	--	55,562 [3]	300,000	70	1,200	--	265	--	--
France	--	--	118 [e]	3,517	17,998	--	--	--	5,867
Georgia[e]	--	300	--	150	857 [3]	--	--	--	30
Germany	--	--	165,000 [e]	2,677	29,894	--	--	3,024	19,676
Greece[e]	--	19,967 [3]	--	130	9,000	--	--	--	200
Hungary	--	--	--	300 [e]	2,560 [e]	--	--	--	--
Iceland	--	--	--	--	140 [e]	--	--	--	5 [e]
Ireland	--	342,500	--	--	2,290 [e]	--	--	--	--
Italy	--	--	10,000	2,954	34,408	--	--	--	4,006
Kazakhstan	--	404,500	318,858	--	6,686	--	350 [e]	--	229
Kosovo	--	4,382	5,500 [e]	--	600 [e]	--	--	--	--
Kyrgyzstan[e]	--	--	--	--	600	--	--	--	1
Latvia	--	--	--	--	1,100 [e]	--	--	--	--
Lithuania	--	--	--	--	843	--	--	--	--
Luxembourg	--	--	--	--	1,078	--	--	--	--
Macedonia	--	35,000	--	--	900 [e]	--	--	--	--
Malta	--	--	--	--	--	--	--	--	6 [e]
Moldova	--	--	--	--	900 [e]	--	--	--	--
Montenegro	--	--	--	--	--	--	--	--	11
Netherlands[e]	--	--	220,000	1,800	2,700	--	--	--	6,000

See footnotes at end of table.

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TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Metals—Continued					Industrial minerals			
	Tungsten, mine output, metal content (metric tons)	Zinc (metric tons)							
		Mine output, metal content	Metal, primary and secondary	Ammonia, N content	Cement, hydraulic	Diamond, natural, gemstones and industrial (thousand carats)	Phosphate rock, P_2O_5 content	Potash, K_2O equivalent	Salt
Europe and Central Eurasia—Continued:									
Norway[e]	--	--	147,775 [3]	300	1,700	--	--	--	--
Poland	--	85,000 [e]	149,000	1,700 [e]	15,812	--	--	--	3,700
Portugal[p]	799	6,421	--	244 [e]	7,200	--	--	--	619
Romania	--	--	200	80 [e]	7,000	--	--	--	2,500
Russia	2,800 [e]	269,000 [e]	260,000 [e]	10,400 [e]	50,400	32,800 [e]	4,000 [e]	6,283	2,200 [e]
Serbia[e]	--	1,000	--	55	2,130 [3]	--	--	--	31 [3]
Slovakia[e]	--	--	--	260	2,888 [3]	--	--	--	100
Slovenia[e]	--	--	--	--	1,000	--	--	--	2
Spain[e]	--	--	505,000	400	50,000	--	--	400	4,600
Sweden[e]	--	198,687 [3]	--	--	2,600	--	--	--	--
Switzerland[e]	--	--	--	30	4,000	--	--	--	500
Tajikistan	--	--	--	NA	288	--	--	--	52 [e]
Turkmenistan[e]	--	--	--	270	1,140	--	--	--	215
Ukraine[e]	--	--	--	3,400	9,457 [3]	--	--	--	4,908 [3]
United Kingdom	--	--	--	1,100 [e]	10,000 [e]	--	--	366 [e]	5,800 [e]
Uzbekistan[e]	--	--	40,000	1,000	6,872 [3]	--	200	--	--
Total, Europe and Central Eurasia	4,740	1,440,000	2,530,000	33,800	335,000	32,800	4,820	15,300	66,700
Share of world total	7.1%	12.0%	20.4%	25.2%	10.0%	25.9%	8.6%	44.9%	24.3%
United States	--	748,000	249,000	8,290	67,200	--	7,400	930	43,300
Share of world total	--	6.2%	2.0%	6.2%	2.0%	--	13.2%	2.7%	15.8%
World total	67,200	12,100,000	12,400,000	134,000	3,360,000	127,000	55,900	34,100	274,000

See footnotes at end of table.

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EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Mineral fuels and related materials					
	Coal			Natural gas, dry (million cubic meters)	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U_3O_8 content (metric tons)
	Anthracite	Bituminous	Lignite			
Europe and Central Eurasia:						
Albania[e]	--	--	4 [3]	8	5,000	--
Armenia	--	--	--	3,000 [e]	--	--
Austria	--	--	--	1,713	6,167	--
Azerbaijan	--	--	--	16,673	352,000 [e]	--
Belarus	--	--	--	213	12,478 [e]	--
Belgium[e]	--	--	--	--	--	--
Bosnia and Herzegovina	--	--	10,976	--	--	--
Bulgaria	--	25	27,200	12	180	--
Croatia	--	--	--	2,727	5,340 [e]	--
Cyprus	--	--	--	--	--	--
Czech Republic	--	11,193	43,931	201	1,173	305 [e]
Denmark-Greenland[e]	--	--	--	8,438 [3]	90,338 [3]	--
Estonia	--	--	--	--	--	--
Finland[e]	--	--	--	--	--	--
France	--	--	--	1,245	6,606	--
Georgia[e]	--	241 [3]	--	8 [3]	371	--
Germany	1,803	11,097	169,403	12,571	18,400	9
Greece[e]	--	--	64,000	11	600	--
Hungary	--	--	9,114	3,100	5,284	--
Iceland	--	--	--	--	--	--
Ireland	--	--	--	402 [e]	--	--
Italy	--	--	--	8,296	35,040	--
Kazakhstan	--	99,285	7,283	37,406	578,000	20,995
Kosovo	--	--	7,958	--	--	--
Kyrgyzstan[e]	--	70	550	14	618	NA
Latvia	--	--	--	--	--	--
Lithuania	--	--	--	--	840 [e]	--
Luxembourg	--	--	--	--	--	--
Macedonia	--	--	7,450 [e]	--	--	--
Malta	--	--	--	--	--	--
Moldova	--	--	--	-- [e]	--	--
Montenegro	--	--	1,938	--	--	--
Netherlands[e]	--	--	--	68,000	9,000	--

See footnotes at end of table.

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TABLE 4—Continued

EUROPE AND CENTRAL EURASIA: PRODUCTION OF SELECTED MINERAL COMMODITIES IN 2010[1]

(Thousand metric tons unless otherwise specified)

Region and (or) country	Mineral fuels and related materials					
	Coal			Natural gas, dry (million cubic meters)	Petroleum, crude (thousand 42-gallon barrels)	Uranium, U_3O_8 content (metric tons)
	Anthracite	Bituminous	Lignite			
Europe and Central Eurasia—Continued:						
Norway[e]	--	1,685 [3]	--	105,280 [3]	777,450 [3]	--
Poland	--	76,728	56,510	5,671	5,100 [e]	--
Portugal[p]	--	--	--	--	1,723	--
Romania	--	--	30,000 [e]	10,800 [e]	33,000 [e]	88 [e]
Russia	8,700	240,750	76,600	651,000	3,530,000 [e]	4,200 [e]
Serbia[e]	--	108 [3]	38,490 [3]	427 [3]	6,420	--
Slovakia[e]	--	--	2,378 [3]	110	140	--
Slovenia[e]	--	--	4,430	7 [3]	1	--
Spain[e]	7,200	2,900	--	330	337 [3]	--
Sweden[e]	--	--	--	--	--	--
Switzerland[e]	--	--	--	--	--	--
Tajikistan	--	200	(5)	23	79	--
Turkmenistan[e]	--	--	--	44,270 [3]	66,100	--
Ukraine[e]	14,000	61,000	200	20,458 [3]	25,400	1,000
United Kingdom	1,454	16,705	--	59,000 [e]	430,791	--
Uzbekistan[e]	--	198 [3]	3,102 [3]	59,439 [3]	13,600	2,830 [3]
Total, Europe and Central Eurasia	33,200	522,000	562,000	1,120,000	6,020,000	29,400
Share of world total	4.2%	9.6%	53.5%	36.0%	22.0%	47.4%
United States	1,760	916,000	66,400	611,000	2,000,000	1,960
Share of world total	0.2%	16.9%	6.3%	19.6%	7.3%	3.2%
World total	794,000	5,440,000	1,050,000	3,120,000	27,400,000	62,100

[e]Estimated; estimated data, U.S. data, and world totals are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. NA Not available.

-- Zero or zero percent.

[1]Totals may not add due to independent rounding. Table includes data available as of February 3, 2012.

[2]Primary production also includes undifferentiated (primary and secondary) production for some countries listed.

[3]Reported figure.

[4]Less than ½ unit.

[5]Available information is not sufficient to make a reliable estimate of output.

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TABLE 5

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED BAUXITE MINE PRODUCTION, 2000–2017[1]

(Thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Albania	5	--	--	--	--	--
Bosnia and Herzegovina	255	1,032	828	1,000	1,000	1,000
Greece	1,966	2,441	2,000	2,100	2,100	2,100
Hungary	1,046	535	365	400	400	400
Italy	300	300	--	--	--	--
Kazakhstan	3,729	4,800	5,310	5,500	5,500	5,500
Montenegro[2]	630	672	61	200	300	400
Romania	--	--	--	--	--	--
Russia	5,274	6,400	5,475	5,500	5,550	5,600
Total	13,200	16,200	14,000	15,000	15,000	15,000

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Prior to 2005, figures are for a combined Serbia and Montenegro.

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TABLE 6
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY ALUMINUM PRODUCTION, 2000–2017[1]

(Thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Austria	158	150	250	250	250	250
Azerbaijan	--	32	30	31	32	33
Belgium	1	--	(2)	(2)	(2)	(2)
Bosnia and Herzegovina	95	131	118	130	130	130
Bulgaria	8	5	12	12	12	12
Croatia	--	--	--	--	--	--
Czech Republic	40	30	45	45	45	45
Denmark-Greenland	16	20	25	25	25	25
Finland	45	34	18	18	18	18
France	701	664	540	550	550	550
Germany	1,216	1,366	1,014	1,000	1,000	1,000
Greece	171	163	133	150	150	150
Hungary	89	81	50	50	50	50
Iceland	224	273	813	815	815	815
Italy	848	1,314	1,414	1,500	1,500	1,500
Kazakhstan	--	--	226	250	250	250
Macedonia	5	4	--	--	--	--
Montenegro[3]	88	117	82	100	100	100
Netherlands	421	391	300	300	300	300
Norway	1,280	1,376	1,100	1,200	1,200	1,200
Poland	52	66	18	18	18	18
Portugal	18	18	18	18	18	18
Romania	181	246	254	260	260	260
Russia	3,245	3,647	3,947	4,000	4,200	4,400
Serbia	NA	(2)	2	2	2	2
Slovakia	137	162	163	160	160	160
Slovenia	84	139	57	80	90	100
Spain	606	637	651	655	655	655
Sweden	127	133	118	120	120	120
Switzerland	224	238	(2)	(2)	(2)	(2)
Tajikistan	269	380	349	351	353	355
Ukraine	233	244	155	130	130	130
United Kingdom	590	574	498	520	550	550
Uzbekistan	2	3	3	3	3	3
Total	11,200	12,600	12,400	13,000	13,000	13,000

[e]Estimated. NA Not available. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Less than 1/2 unit.

[3]Prior to 2005, figures are for a combined Serbia and Montenegro.

TABLE 7
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED COBALT MINE PRODUCTION, 2000–2017[1]

(Co content in metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Kazakhstan	300	--	--	--	--	--
Russia	4,000	6,300	6,200	6,200	6,200	6,200
Total	4,300	6,300	6,200	6,200	6,200	6,200

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

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TABLE 8

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED COPPER MINE PRODUCTION, 2000–2017[1]

(Cu content in thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Albania	--	2	3	3	3	3
Armenia	12	16	31	35	40	45
Bulgaria	92	112	110	110	110	110
Finland	14	16	15	12	12	12
France	(2)	--	--	--	--	--
Georgia	8	10	6	8	10	12
Kazakhstan	430	402	380	400	480	520
Macedonia	6	22	8	8	8	8
Norway	--	--	--	--	--	--
Poland	509	575	481	500	500	500
Portugal	76	90	74	85	90	90
Romania	16	15	5	7	7	7
Russia	570	640	703	720	740	760
Serbia[3]	56	27	19	20	20	20
Slovakia	(2)	(2)	--	--	--	--
Spain	23	5	5	7	9	9
Sweden	78	98	77	60	45	45
Uzbekistan	70	104	90	93	96	98
Total	1,960	2,130	2,010	2,100	2,200	2,200

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Less than 1/2 unit.

[3]Prior to 2005, figures are for a combined Serbia and Montenegro.

TABLE 9

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY REFINED COPPER PRODUCTION, 2000–2017[1]

(Thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Austria	79	72	114	110	110	110
Belgium	423	382	370	500	500	500
Bulgaria	32	61	215	225	225	225
Cyprus	5	--	3	3	3	3
Czech Republic	20	14	14	14	14	14
Finland	114	125	122	125	125	125
France	2	--	--	--	--	--
Germany	710	638	704	700	700	700
Hungary	12	10	--	--	--	--
Italy	73	32	25	25	25	25
Kazakhstan	395	388	323	420	500	520
Norway	27	39	32	30	30	30
Poland	486	560	547	600	600	600
Romania	19	21	4	4	4	4
Russia	840	933	874	890	906	920
Serbia[2]	46	27	35	35	35	35
Slovakia	--	--	--	--	--	--
Spain	316	302	290	310	320	330
Sweden	130	222	235	225	220	220
Ukraine	--	20	20	20	20	20
United Kingdom	3	--	--	--	--	--
Uzbekistan	85	104	90	93	96	99
Total	3,820	3,950	4,020	4,300	4,400	4,500

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Prior to 2005, figures are for a combined Serbia and Montenegro.

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TABLE 10

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED GOLD MINE PRODUCTION, 2000–2017[1]

(Kilograms)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Armenia	600	1,400	2,000	2,000	2,000	2,000
Bulgaria	2,347	3,868	4,400	5,000	5,000	5,000
Denmark-Greenland	--	1,000	1,600	1,600	1,600	1,600
Finland	4,951	3,747	1,785	1,800	1,800	1,800
France	2,632	1,500	1,500	--	--	--
Georgia	2,924	2,000	2,000	2,000	2,000	2,000
Italy	791	--	--	--	--	--
Kazakhstan	28,171	18,062	30,272	40,000	50,000	70,000
Kyrgyzstan	22,000	16,700	18,300	18,600	18,800	19,000
Macedonia	750	400	--	--	--	--
Poland	367	510	500	500	500	500
Romania	500	400	400	400	400	400
Russia	142,738	163,186	189,000	200,000	205,000	210,000
Serbia[2]	1,121	335	356	400	400	400
Slovakia	306	109	534	540	540	540
Spain	4,310	3,971	3,400	3,400	3,400	3,400
Sweden	3,570	6,600	6,300	6,500	6,500	6,500
Tajikistan	2,700	3,000	2,049	2,150	2,200	2,250
Ukraine	--	--	--	--	--	--
Uzbekistan	85,000	84,210	90,000	91,000	92,000	93,000
Total	306,000	311,000	354,000	380,000	390,000	420,000

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Prior to 2005, figures are for a combined Serbia and Montenegro.

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TABLE 11

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED IRON ORE MINE PRODUCTION, 2000–2017[1]

(Fe content in thousand metric tons)

Country	Average iron content	2000	2005	2010	2013[e]	2015[e]	2017[e]
Austria	32%	586	665	662	650	650	650
Azerbaijan	57%	--	4	33	150	170	185
Bosnia and Herzegovina	42%	182	702	588	850	850	850
Bulgaria	50%	178	--	--	--	--	--
Czech Republic	29%	6	--	--	--	--	--
France	28%	--	--	--	--	--	--
Germany[2]	11%	65	38	41	40	40	40
Greece	38%	575	575	560	500	500	500
Kazakhstan	57%	9,200	11,100	13,800	15,000	17,000	17,000
Macedonia	40%	9	--	--	--	--	--
Norway	62%	369	420	3,105	3,200	3,200	3,200
Portugal	36%	12	10	10	10	10	10
Romania	52%	55	69	--	--	--	--
Russia	58%	50,000	56,100	58,500	59,000	59,500	60,000
Serbia[3]	45%	1	--	--	--	--	--
Slovakia	34%	255	180	130	130	130	130
Spain	38%	--	--	--	--	--	--
Sweden	65%	13,556	15,300	16,750	16,000	16,000	15,000
Ukraine	55%	30,600	37,700	43,000	45,000	48,000	50,000
United Kingdom	54%	1	(4)	--	--	--	--
Total	XX	106,000	123,000	137,000	140,000	145,000	150,000

[e]Estimated. XX Not applicable. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to use in the steel industry.

[3]Prior to 2005, figures are for a combined Serbia and Montenegro.

[4]Less than 1/2 unit.

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TABLE 12

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED CRUDE STEEL PRODUCTION, 2000–2017[1]

(Thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Albania	65	87	440	450	450	450
Austria	5,725	7,031	7,206	7,000	7,000	7,000
Azerbaijan	--	286	129	150	160	170
Belarus	1,623	2,076	2,672	2,800	2,900	3,000
Belgium	11,635	10,420	8,088	9,000	9,000	9,000
Bosnia and Herzegovina	134	283	593	650	650	650
Bulgaria	2,023	1,969	740	1,000	1,000	1,000
Croatia	71	74	103	400	400	400
Czech Republic	6,216	6,189	5,180	6,000	6,500	6,500
Denmark-Greenland	803	--	--	--	--	--
Finland	4,096	4,738	4,023	4,000	4,000	4,000
France	21,002	19,481	15,414	17,000	18,000	18,000
Georgia	(2)	--	--	--	--	--
Germany	46,376	44,524	43,830	45,000	45,000	45,000
Greece	1,088	2,266	1,839	2,000	2,000	2,000
Hungary	1,969	2,005	1,678	2,000	2,000	2,000
Ireland	342	--	--	--	--	--
Italy	26,544	29,061	25,750	28,000	30,000	30,000
Kazakhstan	4,770	4,452	4,256	7,000	7,000	7,000
Latvia	500	550	550	550	550	550
Luxembourg	2,571	2,194	2,563	2,500	2,500	2,500
Macedonia	161	326	292	300	300	300
Moldova	909	1,000	242	850	900	950
Montenegro	NA	104	95	50	100	100
Netherlands	5,667	6,919	6,651	7,000	7,000	7,000
Norway	620	701	514	600	600	600
Poland	10,508	8,336	7,996	9,000	10,000	10,000
Portugal	1,097	1,400	1,400	1,400	1,400	1,400
Romania	4,672	6,280	3,721	5,000	5,000	5,000
Russia	59,097	66,186	66,300	66,400	66,500	66,600
Serbia[3]	682	1,286	1,254	1,200	1,200	1,200
Slovakia	3,733	4,242	4,580	5,000	5,000	5,000
Slovenia	519	583	606	600	600	600
Spain	15,844	17,800	16,311	16,500	17,000	17,000
Sweden	5,227	5,692	4,844	5,000	5,000	5,000
Switzerland	1,020	1,158	1,330	1,400	1,400	1,400
Ukraine	31,780	38,636	33,599	40,000	43,000	48,000
United Kingdom	15,306	13,210	9,709	13,000	13,000	13,000
Uzbekistan	420	607	745	770	800	820
Total	295,000	312,000	285,000	310,000	320,000	320,000

[e]Estimated. NA Not available. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Less than 1/2 unit.

[3]Prior to 2005, figures are for a combined Serbia and Montenegro.

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TABLE 13

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PALLADIUM MINE PRODUCTION, 2000–2017[1]

(Kilograms)

Country[2]	2000	2005	2010	2013[e]	2015[e]	2017[e]
Poland	12	10	15	15	15	15
Russia	95,000	97,400	84,700	85,000	85,000	85,000
Serbia[3]	21	19	22	20	20	20
Total	95,000	97,400	84,700	85,000	85,000	85,000

[e]Estimated.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Palladium production for Finland and Norway has not been estimated.

[3]Prior to 2005, data are for a combined Serbia and Montenegro.

TABLE 14

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PLATINUM MINE PRODUCTION, 2000–2017[1]

(Kilograms)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Finland	441	678	275	200	200	200
Norway[2]	1,000	--	--	--	--	--
Poland	21	20	25	25	25	25
Russia	27,000	29,000	25,000	26,000	26,000	26,000
Serbia[3]	3	3	--	--	--	--
Total	28,500	29,700	25,300	26,000	26,000	26,000

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Data prior to 2005 represent exports.

[3]Prior to 2005, data are for a combined Serbia and Montenegro.

TABLE 15

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED TIN MINE PRODUCTION, 2000–2017[1]

(Sn content in metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Kyrgyzstan	300	--	--	--	--	--
Portugal	218	243	22	22	22	22
Russia	2,500	3,000	160	100	100	100
Spain	233	--	--	--	--	--
Total	3,250	3,240	182	120	120	120

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

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TABLE 16
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED PRIMARY AND SECONDARY TIN METAL PRODUCTION, 2000–2017[1]

(Metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
France	1,500	1,500	--	--	--	--
Russia	5,300	5,500	400	400	400	400
Total	6,800	7,000	400	400	400	400

[e]Estimated. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

TABLE 17
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED DIAMOND MINE PRODUCTION, 2000–2017[1]

(Thousand carats)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Russia:						
Gem grade	17,500	23,000	17,800	18,000	18,000	18,000
Industrial grade	11,700	15,000	15,000	15,000	15,000	15,000
Total	29,200	38,000	32,800	33,000	33,000	33,000

[e]Estimated.

[1]Estimated data and totals are rounded to no more than three significant digits.

TABLE 18
EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED LITHIUM PRODUCTION, 2000–2017[1]

(Li content in metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Portugal	NA	26,185	40,609	41,000	42,000	44,000

[e]Estimated. NA Not available.

[1]Estimated data and totals are rounded to no more than three significant digits.

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TABLE 19

EUROPE AND CENTRAL EURASIA: HISTORIC AND PROJECTED SALABLE COAL PRODUCTION, 2000–2017[1, 2]

(Thousand metric tons)

Country	2000	2005	2010	2013[e]	2015[e]	2017[e]
Albania	21	13	4	5	5	5
Austria	1,255	14	--	--	--	--
Bosnia and Herzegovina	7,441	9,144	10,976	13,000	15,000	15,000
Bulgaria	27,094	24,909	27,225	28,000	28,000	28,000
Czech Republic	68,091	61,903	55,124	56,000	56,000	56,000
France	4,102	--	--	--	--	--
Georgia	7	5	241	300	350	400
Germany	201,975	202,815	182,303	177,000	175,000	172,000
Greece	64,026	73,585	64,000	65,000	65,000	65,000
Hungary	14,276	9,580	9,114	9,500	9,500	9,500
Italy	19	--	--	--	--	--
Kazakhstan	74,872	86,385	106,568	110,000	120,000	130,000
Kosovo	NA	6,391	7,958	8,000	8,000	8,000
Kyrgyzstan	425	340	620	630	640	650
Macedonia	7,516	6,949	7,450	7,450	7,450	7,450
Montenegro	NA	1,297	1,938	1,900	1,900	1,900
Norway	330	300	1,685	1,800	1,800	1,800
Poland	162,815	159,039	133,238	135,000	135,000	135,000
Romania	29,294	34,201	30,000	30,000	30,000	30,000
Russia	273,578	298,300	326,050	330,000	335,000	340,000
Serbia[3]	32,275	34,993	38,598	38,000	38,000	38,000
Slovakia	3,589	2,511	2,378	2,500	2,500	2,500
Slovenia	4,480	4,539	4,430	4,400	4,400	4,400
Spain	23,470	19,354	10,100	10,600	11,000	11,000
Tajikistan	21	99	200	200	200	200
Ukraine	81,907	74,559	75,200	80,000	85,000	90,000
United Kingdom	31,972	20,498	18,159	18,000	18,000	18,000
Uzbekistan	2,556	3,000	3,300	3,350	3,400	3,450
Total	1,120,000	1,130,000	1,120,000	1,130,000	1,150,000	1,170,000

[e]Estimated. NA Not available. -- Zero.

[1]Estimated data and totals are rounded to no more than three significant digits.

[2]Includes anthracite, bituminous, and run-of-mine lignite.

[3]Prior to 2005, figures are for a combined Serbia (including Kosovo) and Montenegro.

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The Mineral Industry of Albania

By Mark Brininstool

Albania's important mineral deposits included chromite, copper, limestone, and petroleum. In 2010, Albania's gross domestic product (GDP) increased by 3.5%. In 2009 (the most recent year for which data were available), industrial production made up about 9% of the GDP, and the mineral extraction industry accounted for about 9% of the value of industrial production and almost 1% of the GDP (Institute of Statistics of the Republic of Albania, 2010; International Monetary Fund, 2011, p. 185).

Production

Data on mineral production in Albania were mostly unavailable, and production data for all mineral commodities in 2010 were estimated with the exception of chromite, clay, copper ore, and lignite production. Clay production increased by 227% compared with that of 2009, and copper ore production increased by 37%. Cement production was estimated to have increased by 17% owing to the start of production at Antea Cement Sh.A.'s new cement plant. Lignite production decreased by 55% (table 1).

Structure of the Mineral Industry

As of December 2009, 832 outstanding permits for prospecting, exploration, and mining were reported; 680 of these permits were for mining. Out of the 832 outstanding permits, the largest number were for limestone (282 permits), chromite (262 permits), and iron-nickel and nickel-silicate (37 permits). In early 2010, Antea Cement began production at its new 1.5-million-metric-ton-per-year cement plant in the Kruje region north of Tirana. Antea Cement was majority owned by the Titan Cement S.A. of Greece. Colacem Albania Sh.p.k. opened a full-cycle cement plant in Balldre in 2010, but no information was available as to whether cement production began in 2010. Stream Oil and Gas Ltd. of Canada was added to the list of natural gas and petroleum producers in table 2. Stream began production in 2008. Table 2 is a list of major mineral industry facilities (National Agency of Natural Resources of Albania, 2010, p. 9; Stream Oil and Gas Ltd., 2010, p. 7; Colacem S.p.A., 2011; Titan Group, 2011, p. 25).

Outlook

Albania has the potential to increase its production of metals and mineral fuels as exploration projects continue and as foreign companies increase investments in Albania. Further investment will depend on economic and social stability as well as on the improvement of infrastructure.

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TABLE 1
ALBANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009[e]	2010[e]
METALS						
Chromite, gross weight (18% to 42% Cr_2O_3)		212,581	199,771	207,104	288,759 [r, 3]	289,687 [3]
Copper:						
Ore, gross weight		35,071	98,000	105,000	114,286 [r, 3]	156,212 [3]
Cu content or ore (1.3% to 2.5%)[e]		670	1,900	2,000	2,300	3,100
Iron and steel:						
Metal, ferroalloys, ferrochromium		17,040	--	11,916	7,556 [3]	8,000
Steel:						
Crude steel, secondary		205,534	263,271	380,000	440,000 [3]	440,000
Rolled steel		114,000	136,000	194,000	216,000 [r, 3]	216,000
Iron-nickel and nickel-silicate ores[4]		79,000	369,559	353,290	350,000	350,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	525	889	918 [e, r]	1,110 [r]	1,300
Clay, kaolin	do.	562 [r]	856 [r]	724 [r]	296 [r, 3]	968 [3]
Gypsum		19,683	46,200	77,633	78,000	80,000
Limestone	cubic meters	1,339,440	1,716,122	3,837,529	3,800,000	3,800,000
Salt[e]		25,000	25,000	25,000	25,000	25,000
Silica sands	cubic meters	3,200	4,400	12,077	12,000	12,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, lignite		3,800	4,000	1,500	7,840 [r]	3,500 [3]
Gas, natural, gross production	thousand cubic meters	11,091	10,400 [r]	6,200 [r]	7,900 [r]	8,000
Petroleum:						
Crude, gross weight[e]	thousand 42-gallon barrels	2,080 [r]	3,580	4,000	4,200	5,000
Refinery products:						
Bitumen		83,000	69,000	92,000	92,000	92,000
Coke		64,000	59,000	47,000	47,000	47,000
Fuels[e]	thousand 42-gallon barrels	2,060	2,010	1,400	1,400	1,400

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through July 19, 2011.

[2]In addition to the commodities listed, a variety of industrial minerals and construction materials (common clay, dolomite, lime, olivinite, sand and gravel, and stone) were believed to have been produced, but output is not reported quantitatively, and available information is inadequate to make reliable estimates of output. Also, a small amount of bauxite was believed to have been produced.

[3]Reported figure.

[4]Iron-nickel and nickel-silicate ore production were not reported separately. Estimates of metal content of ores were not made owing to the significant variations of the iron and nickel content of the ores, which depend not only on the type of ore, but also on the region in which it was mined. Iron-nickel ores were reported to contain from 37.22% to 44.72% Fe and from 0.97% to 1.07% Ni; nickel-silicate ores were reported to contain from 16.6% to 21.73% Fe and from 1.06% to 1.2% Ni.

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TABLE 2
ALBANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity[e]
Cement		Fushe Kruje Cement Factory, Sh.p.k. (Seament Holding)	Fushe Kruje, 35 kilometers north of Tirana	1,320
Do.		Elbasan Cement Factory (Seament Holding)	Elbasan, 32 kilometers southeast of Tirana	775
Do.		Antea Cement Sh.A. (Titan Cement S.A.)	Kruje, 35 kilometers north of Tirana	1,500
Do.		Colacem Albania Sh.p.k. (Colacem S.p.A.)	Balldre, northwestern Albania	NA
Chromite		Albanian Chrome, Sh.p.k. (ACR) (DCM DECOmetal, 100%)	Mine in Bulquize, 40 kilometers northwest of Tirana	85
Do.		do.	Pogradec (including Katjiel and Pojske Mines)	NA
Do.		Numerous small producers	Mostly concentrated near Bulquize	NA
Ferrochromium		Albanian Chrome Sh.p.k. (ACR) (DCM DECOmetal, 100%)	Elbasan, 32 kilometers southeast of Tirana	36
Lime		Kurum International Sh.p.k.	Elbasan	36
Natural gas	million cubic meters	Albpetrol sh.a. (Government owned)	Gasfields in southwestern Albania	NA
Do.	do.	Stream Oil and Gas Ltd.	Delvina gas field in southern Albania	50
Petroleum:				
Crude	42-gallon barrels per day	do.	Oilfields at Marineza, Ballsh, Sheqishte, Patos, Gorrisht, and others	NA
Do.	do.	Bankers Petroleum Ltd.	Oilfields at Kucova and Patos Marinza, east of Fier in south-central Albania	9,600
Do.	do.	Stream Oil and Gas Ltd.	Ballsh-Hekal, Cakran-Mollaj, and Gorischt-Kocul oilfields in southwestern Albania	345
Refined	do.	Albanian Refining and Marketing Organization Sh.a. (ARMO)	Refineries at Ballsh and Fier	NA
Steel		Kurum International Sh.p.k.	Electric arc furnace plant at Elbasan	600

[e]Estimated. Do., do. Ditto. NA Not available.

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The Mineral Industry of Armenia

By Elena Safirova

Armenia was a significant producer of molybdenum and ranked seventh in the world in mine output in 2010 (Polyak, 2012). Besides molybdenum, Armenia produced other metals, which included copper, gold, silver, and zinc, and industrial minerals, which included cement, diatomite, gypsum, limestone, and perlite. The country also produced aluminum foil from aluminum imported from Russia, ferromolybdenum, molybdenum metal, and rhenium salt (potassium perrhenate) from local ores; it also had developed a diamond-cutting industry based on imported diamond. Armenia possesses resources of copper, gold, iron, lead, molybdenum, and zinc. It also has resources of construction material, such as basalt, granite, limestone, marble, and tuff; semiprecious stones, such as agate, jasper, and obsidian; and other nonmetallic minerals, such as bentonite, diatomite, perlite, and zeolites (Sarmakeshyan, 2011; U.S. Central Intelligence Agency, 2012).

The country had almost no domestic fuel production; most of domestically produced electricity was generated by one nuclear powerplant and several hydroelectric powerplants. It imported fuel for its nuclear powerplant and natural gas from Russia. Since 2006, Armenia also had received natural gas from Iran through a direct pipeline between the two countries, in addition to tanker trucks. Armenia and Iran continued to participate in a program of direct exchange of natural gas for electric power (U.S. Department of State, 2012).

Minerals in the National Economy

In 2010, Armenia's gross domestic product (GDP) increased by 2.1%. Although a big improvement compared with the 14.1% decrease of 2009, the 2010 growth rate was much lower than the annual growth rates for the period 2000 through 2007, which averaged 13%. The share of industrial production in the total GDP was 37.7%, and the share of the mining industry in total industrial production was 13.8% (National Statistical Service of the Republic of Armenia, 2011a, b; U.S. Department of State, 2012).

Armenia's political isolation from two of its nearest neighbors, Azerbaijan and Turkey, made the country especially vulnerable to changes in the global economic environment. Armenia's severe trade imbalance was somewhat offset by foreign direct investment, international aid, and remittances from Armenians working abroad. In 2010, the country's exports, which were valued at $1.04 billion, were much lower than the country's imports of $3.75 billion. Mineral commodities played an important part in the country's exports. The main export commodities were copper, diamond, energy, foodstuffs, nonferrous metals, and other mineral products. Overall, nonprecious metals and products made out of them accounted for $332 million, or 30% of the country's export revenue; mineral products accounted for $307 million, or 27.7%; and precious stones and metals contributed $134 million, or 12.1%. The main export partners of Armenia were Russia (which accounted for 15.4% of export revenue), Bulgaria (15.0%), Germany (12.7%), the Netherlands (9.5%), and Iran (8.1%). In 2010, Armenia imported diamond, foodstuffs, natural gas, petroleum, and tobacco products. The main trade partners for imports were Russia (which accounted for 22.3%, by value, of Armenia's imports), China (10.8%), Ukraine (6.1%), Germany (5.6%), and Turkey (5.6%) (National Statistical Service of the Republic of Armenia, 2011a, b; U.S. Central Intelligence Agency, 2012).

Production

Data on mineral production are in table 1.

Structure of the Mineral Industry

Foreign investors controlled a significant share of Armenia's mineral industry. ARMENAL, which operated a foil mill in Kanaker, was a subsidiary of United Company RUSAL of Russia. Cronimet Mining AG of Germany was the main shareholder of the Zangezur copper-molybdenum complex and the Yerevan Pure Iron Works. GeoProMining Ltd. of Russia, which was a privately owned mineral resource company established in 2001, had assets in Armenia that included the Agarak copper-molybdenum mining and processing complex, the Ararat gold recovery plant, and the Sotk gold mine. GeoProMining produced gold in the form of dore and antimony, copper, and molybdenum concentrates. The electricity distribution system was privatized in 2002 and purchased by Russia's United Energy System (RAO-UES) in 2005 (GeoProMining Ltd., 2012; United Company RUSAL, 2012; U.S. Department of State, 2012). Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Aluminum.—The ARMENAL aluminum foil rolling mill was one of the leading production facilities in Armenia and was the only producer of aluminum foil in the Caucasus and Central Asia regions. It was formed from the Kanaker aluminum plant in Yerevan in 2000 and was currently a part of RUSAL's packaging division. In the mid-2000s, ARMENAL underwent a $70 million modernization, and in 2010, had the technical capability to manufacture thin foil (6 to 9 microns thick). ARMENAL's annual capacity was 18,000 metric tons (t) of thin foil and 7,000 t of household foil. As of 2010, ARMENAL employed 700 people with an average monthly wage of about $650. Most of the plant's output was exported to the United States, Europe, and the Middle East (Azom.com, 2005; United Company RUSAL, 2012).

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Copper and Molybdenum.—The leading producer of copper and molybdenum concentrates in Armenia was the Zangezur copper-molybdenum complex followed by the Agarak copper-molybdenum mining and processing complex. The Zangezur Copper Molybdenum Combine (ZCMC) was established in 1951 to develop the Kajaran deposit, and it was a major employer in the city of Kajaran. In 2010, ZCMC employed 3,200 people. Cronimet Mining AG held 60% of the shares in ZCMC (Novostink.ru, 2010a, b).

The Agarak Copper Molybdenum Combine (ACMC) included the Agarak Mine and a beneficiation plant. ACMC was acquired by GeoProMining in 2007. GeoProMining specialized in the extraction and processing of polymetallic ores (antimony, copper, and molybdenum) and precious metals (gold and silver). During 2010, ACMC increased its production of copper and molybdenum concentrates by 110%. As of 2010, ACMC was in the process of implementing an investment program aimed at technical re-equipment of the deposit and reconstruction of the plant. The reconstruction was expected to increase the processing capacity from 3 million metric tons (Mt) to 3.5 Mt as well as reduce production costs by 10% (PanARMENIAN.net, 2010; Infogeo.ru, 2011).

Armenian Molybdenum Production LLC (AMP) in Yerevan was founded in 2003 and specialized in ferromolybdenum production. The company had the capacity to produce 3,600 metric tons per year of ferromolybdenum; in addition to processing Armenian concentrate, AMP imported concentrates from Chile, China, Peru, Russia, and other countries. AMP was owned by Cronimet Mining AG (51%) and Armenian residents (49%) (Armenian Molybdenum Production, 2012; Cronimet Mining AG, 2012).

Yerevan Pure Iron Works produced pure molybdenum (99.6% grade), ferromolybdenum (70% Mo content), and potassium perrhenate (rhenium salt with 64% Re content). The entire production of the plant was exported, mostly to Europe. The company processed mainly molybdenum concentrate mined by ZCMC from the Kajaran copper-molybdenum deposit. The company also owned a 15% stake in the Zangezur complex.

Gold.—The Ararat Gold Recovery Co. (AGRC) continued to mine the Sotk deposit. As of 2010, AGRC was a subsidiary of GeoProMining. AGRC had a gold processing facility in the city of Ararat. AGRC also owned a large open pit gold mine at Zod in eastern Armenia, close to the border with Azerbaijan. In the late 1990s, Azerbaijan protested when AGRC started mining at Zod because it was thought that a significant portion of the resources were located on Azerbaijani territory. The local population was also concerned about the environmental consequences of gold extraction, such as the effect of cyanide used in gold production on land and water pollution (Cooke, 2008; Miningexpo.ru, 2010).

GeoProMining was planning to reconstruct AGRC's beneficiation plant to be able to apply new Albion technology to process the remaining sulfide ores. The construction of the new plant was expected to be completed in 2013 (Metalinfo.ru, 2011).

Outlook

In the next few years, Armenia is likely to continue developing its facilities for processing copper, gold, and molybdenum. Although the country has made significant efforts to attract foreign investment, some of the impediments for potential investors, such as lack of transparency in the tax system and customs operations and unequal competition between domestic and foreign firms, remain. Continued economic growth in all sectors, including the mineral sector, is likely to depend on the ability of the Government to strengthen its macroeconomic management, including improving the investment climate and combatting corruption.

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TABLE 1

ARMENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum, foil		945	12,256	11,646	21,456	24,617
Copper:						
Concentrate, Cu content		18,000 e	17,600 e	18,800	23,233 r	31,062
Blister, smelter, primary		8,791	6,954	6,480	6,858	7,644
Ferroalloys:						
Ferromolybdenum		4,865	5,977	5,323	5,144	5,126
Ferrotungsten[e]		42 [2]	45 [2]	45	40	40
Gold, mine output, Au content	kilograms	1,300 r,e	1,300 r,e	1,359 r	944 r	2,000
Molybdenum:						
Concentrate, Mo content		4,088 r	4,295 r	4,472 r	4,365 r	4,335
Metal		487	500	520	500	469
Rhenium[e]	kilograms	1,200	400 r	400 r	400 r	400
Silver	do.	40,434 r	37,324 r	40,434 r	52,876 r	68,428
Zinc, concentrate, Zn content		2,932 r	2,585 r	4,200	3,800 r	4,298
INDUSTRIAL MINERALS						
Barite[e]		600	600	600	500	550
Caustic soda		4,166	5,484	4,476	1,138 r	960
Cement	thousand metric tons	625	722	770	467	488
Clays:						
Bentonite		37,000	40,000	40,000	38,000	41,000
Bentonite, powder		720	1,129	1,100 e	1,000	1,100
Diamond, cut	carats	184,000	123,000	100,945 r	49,573 r	67,992
Diatomite		180	200	200 e	180	220
Gypsum		43,700	54,600	45,900	40,100 r	45,000 e
Limestone	thousand metric tons	17,000 e	18,000	18,000 e	15,000	18,000
Perlite[e]		35,000	35,000	35,000	35,000	35,000
Salt		37,000	34,800	37,300	37,000 r,e	40,000 e
MINERAL FUELS AND RELATED MATERIALS						
Natural gas, dry[e]	million cubic meters	1,596 [2]	2,285 [2]	3,000	3,000	3,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto.

[1]Table includes data available through March 20, 2012.

[2]Reported figure.

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TABLE 2

ARMENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit name	Annual capacity[e]
Aluminum, rolled and foil	ARMENAL (formerly Kanaker aluminum plant) (United Company RUSAL)	Kanaker	25,000
Cement	Aarattsement Group	Ararat region	NA
Do. thousand metric tons	Mika-Cement	Hrazdan	1,200
Copper:			
Mine output, Cu content	Facilities in operation:		30,000 [2]
	Agarak copper-molybdenum mining and processing complex (GeoProMining Ltd.)	Agarak	
	Kapan mining complex (Deno Gold Mining Co.)	Kapan	
	Zangezur copper-molybdenum complex [Cronimet Mining AG, 60%; Yerevan Pure Iron Works, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	
	Facilities not in operation:		
	Akht'ala mining complex	Akht'ala	
	Shamlugh mining complex	Shamlugh	
Blister	CJSC Armenian Copper Programme (ACP) (Valex F.M. Establishment, 81%, and Russian businessman, 19%)	Alaverdi	15,000
Diamond, cut stones	Aghavni diamond-cutting works[3]	Nor Geghi	NA
Do.	Amma group diamond-cutting works[3]	Artashat	NA
Do.	Andranik-Dashk diamond-cutting works	Nor Hachyn	NA
Do.	Arevakn diamond producing plant	do.	NA
Do.	Diamond Company of Armenia (DCA)	Yerevan	NA
Do.	Diamond Tech	Talin	NA
Do.	Lori diamond-cutting works	Nor Hachyn	NA
Do.	Lusampor[3]	Melik'gyugh	NA
Do.	Punji diamond-cutting works[3]	Yerevan	NA
Do.	Sapphire diamond-cutting works	Nor Hachyn	NA
Do. thousand carats	Shoghakan gem-cutting plant	do.	120
Gold kilograms	Zod mining complex	Zod	2,000
Do.	Megradzor deposit	Meghradzor	NA
Do.	Lichkvazkoye, Shaumyanskiy Rayon, Sotkskoye, and Terterasarskoye deposits	NA	NA
Iron ore	Hrazdan deposit	Hrazdan region	NA
Molybdenum:			
Mine output, Mo content	Agarak copper-molybdenum mining and processing complex (GeoProMining Ltd.)	Agarak	2,000
Do.	Zangezur copper-molybdenum complex [Cronimet Mining AG, 60%; Yerevan Pure Iron Works, 15%; Armenian Molybdenum Production LLC (AMP), 12.5%; Zangezur Mining LLC, 12.5%]	Kajaran	20,400
Metal, ferromolybdenum	Armenian Molybdenum Production LLC (AMP) (Cronimet Mining AG, 51%, and Armenian residents, 49%)	NA	3,600
Do.	Yerevan Pure Iron Works	Yerevan	NA
Perlite thousand metric tons	Aragats perlite mining-beneficiation complex	Aragats deposit	1,110
Zinc, mine output, Zn content	Kapan mining complex (Deno Gold Mining Co.)	Kapan	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

[3]Current existence of enterprise cannot be confirmed.

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THE MINERAL INDUSTRY OF AUSTRIA

By Steven T. Anderson

During 2010, the Erzberg open pit iron ore mine at Eisenerz in the State of Styria and the underground tungsten mine at Mittersill in the State of Salzburg were the only metal mines still in operation in Austria. This was not the case with the industrial minerals sector, however, which still produced dolomite, gypsum, kaolin, lime, limestone, magnesite, salt, silica (quartz) sand, talc, and other industrial mineral products. Excluding production (if any) in the United States[1] in 2010, Austria was estimated to have been the fourth ranked producer of tungsten in the world and the fifth ranked producer of magnesite and to have accounted for 1.6% and 4%, respectively, of the world's production. The country was also estimated to have accounted for about 1% of the world's production of natural gypsum in 2010 (including production by the United States) (table 1; Crangle, 2011; Kramer, 2011; Shedd, 2011).

Minerals in the National Economy

In 2010, the value of production by the mining and quarrying sector (not including production of crude petroleum and natural gas) in Austria accounted for about 0.4% (or slightly greater than $1.5 billion[2]) of the country's gross domestic product (GDP) compared with 0.36% (or slightly less than $1.4 billion) in 2009. In 2010, the real value of output in the sector (at 2009 prices) increased by 4.6% compared with a decrease of 3.5% in 2009 (at 2008 prices). Planned investment in the ferrous metals sector decreased to $411 million in 2010 from $763 million in 2009; that in the stones and ceramics sector decreased to $207 million from a revised planned investment of about $226 million in 2009; that in the nonferrous metals sector increased to about $100 million from a revised planned estimate of $53 million in 2009; and that in the mining and quarrying sector increased to $73 million from $47 million in 2009 (International Monetary Fund, 2011; Wirtschaftskammer Österreich, 2011b, p. 26–27, 53; 2011c, p. 42).

In 2010, there were about 5,800 employees in the mineral extraction sector (including production of crude petroleum and natural gas) compared with a revised figure of about 5,600 employees in 2009, and employees in the mineral extraction sector accounted for slightly greater than 0.17% of all employees in Austria compared with slightly less than 0.17% in 2009. Information on the average salary of the employees in the mineral industry, the minerals extraction sector, or just the mining and quarrying sector in 2010 was not available. According to a survey in March 2010, however, employees in the natural gas and petroleum sector earned about $6,800 per month, on average; those in the mining and steel producing sector earned about $5,100 per month; and those in the building materials and ceramics sector earned about $4,600 per month (Wirtschaftskammer Österreich, 2010; 2011b, p. 35, 42; 2011d; International Monetary Fund, 2011).

An exact mineral trade balance or the detailed data to calculate one accurately were not available. More-aggregated data, however, indicated that the value of Austria's exports of raw materials (including nonfuel minerals) increased to $4.9 billion in 2010 from $4.1 billion in 2009, and that of the country's imports of raw materials increased to $7.7 billion from a revised figure of $5.5 billion. Also, the value of exports of fuels and energy (including mineral fuels) increased to $4.7 billion in 2010 from a revised figure of about $4.2 billion in 2009, and that of imports of fuels and energy increased to $16.3 billion from a revised figure of $13.7 billion. Thus, Austria's trade balance for energy, fuels, and raw materials (including most of the mineral trade balance as a subset) was –$14.4 billion in 2010 compared with a slightly revised balance of –$10.9 billion in 2009. It is not clear whether petroleum refinery products are included in the above trade balance, but other mineral-based manufactured products (such as pig iron and steel) are not (International Monetary Fund, 2011; Wirtschaftskammer Österreich, 2011c, p. 60–61).

Because processed metals and industrial mineral products probably accounted for a greater proportional share of the total value of output of the country's mineral industry than did mineral raw materials, it is useful to look at the trade data that is available for nonfuel mineral-based manufactured products. The value of Austria's exports of manufactured ferrous metals (including iron and steel, and possibly including ferroalloys) increased to about $8.1 billion in 2010 from $6.9 billion in 2009, and the value of imports of ferrous metals increased to about $4.5 billion from about $3.8 billion; the value of exports of nonferrous metals (including such products as aluminum and tungsten carbide, metal, and oxide powders) increased to $4.4 billion in 2010 from about $3.1 billion in 2009, and that of imports of nonferrous metals increased to about $4.3 billion from $2.9 billion; and the value of exports of nonmetallic mineral products (estimated to include such intermediate products as cement and such other industrial mineral products as ceramics and glass) increased to $2.6 billion in 2010 from $2.4 billion in 2009, and that of imports of industrial mineral products increased to $2.1 billion from $2 billion. Thus, Austria's trade balance for mineral-based manufactured products increased to $4.2 billion in 2010 compared with about $3.8 billion in 2009 (Bundesministerium für Wirtschaft, Familie und Jugend, 2010b, p. 7–9; 2011, p. 7–8; International Monetary Fund, 2011; Wirtschaftskammer Österreich, 2011c, p. 60–61).

[1]U.S. data were withheld to avoid disclosing company proprietary data.

[2]Where necessary, values have been converted from European Union euros (€) to U.S. dollars (US$) at an annual average exchange rate of €0.718=US$1.00 for 2009 and about €0.7536=US$1.00 for 2010. All values are nominal, at current prices, unless otherwise stated.

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Government Policies and Programs

The basis of Austria's mining law is the Mineralrohstoffgesetz (MinroG) (Federal Law BGBl. I. no. 38/1999), or "Mineral Resources Law," which came into effect on January 1, 1999, in replacement of the country's previous mining law (BGBl. 259/1975) that had been in effect since April 11, 1975. Through 2010, the MinroG had been amended by Federal Laws BGBl. I no. 21/2002, BGBl. I no. 112/2003, BGBl. I no. 85/2005, BGBl. I no. 84/2006, BGBl. I no. 113/2006, BGBl. I no. 115/2009, BGBl. I no. 65/2010, and BGBl. I no. 111/2010; and by the publication BGBl. I no. 83/2003. The MinroG applies to the exploration for, production of, and processing of minerals in the country; the use of workings of unused mines; and the exploration for, locating of, and evaluation of the suitability of such geologic structures as caverns for holding or storing substances, such as liquid and gaseous mineral fuels. The two regulations that were approved in 2010 and amended the MinroG were BGBl. I no. 65/2010, which included some changes to emissions regulations for boilers and mining operations, and BGBl. I no. 111/2010, which mandated some changes in the assessment of royalties on production by mining and hydrocarbon operations (starting in 2011). Three environmental laws that were directly applicable to mining and other mineral production and processing operations in the country were the Remediation Act of 1989 (BGBl. no. 299/1989), as last amended in 2008 by BGBl. I no. 40/2008; the Environmental Information Act of 1993 (BGBl. no. 495/1993), as last amended in 2005 by BGBl. I no. 6/2005; and the Environmental Impact Assessment Act of 2000 (BGBl. no. 697/1993), as last amended in 2006 by BGBl. I no. 149/2006 (Bundeskanzleramt Österreich, 2010a; 2010b, p. 118–119; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 23–30; undated; Rohöl-Aufsuchungs Aktiengesellschaft, undated).

As a member of the European Union (EU), Austria participated in developing minerals security and energy strategies for the EU, and the country's own policies in this realm were affected by the policies and measures adopted by the EU. In 2010, the Austrian Government participated in the European Commission (EC)'s working groups to better define the critical minerals for the EU and to exchange information on best practices for land use planning, permitting, and geologic knowledge sharing between EU members, and the EC cited the Austrian mineral resources plan (development of which was begun in 2001) as an example of best practices in the area of land use planning. With respect to critical minerals, the Austrian Government had considered defining mineral protection zones for (potentially) economic deposits of antimony, graphite, and magnesite in the country within the context of its mineral resources plan (Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 1–6).

In April 2009, the ministers of two Austrian Federal Government ministries convened a working group to develop measures as part of a new Austrian energy strategy that would enable the country to develop a sustainable energy system. These measures could make energy services available for private consumption as well as for businesses in the future while still implementing EU rules. The core objectives of the new Austrian energy strategy were as follows:

- Energy efficiency—An improvement in energy efficiency at all stages of the provision and use of energy
- Renewable energy—A focus on hydropower (including pump storage), wind power, and biomass and photovoltaic sources of power
- Security of supply—To be increased and aimed at the highest possible degree of cost effectiveness.

The working group also suggested that Austria's targets for 2020 should be that 34% of Austrian energy consumption comes from renewable resources, and that greenhouse gas emissions are reduced by 16% below 1990 levels in sectors that do not participate in the EU's Emissions Trading System. In order for the demand for energy services in Austria to be met in a way that is compatible with the EU climate and energy targets for 2020, the Austrian working group recommended that the new Austrian energy strategy set the target for total energy consumption in Austria in 2020 to be no more than 1,100 petajoules (Bundesministerium für Wirtschaft, Familie und Jugend, 2010a).

Production

Data on Austria's mineral production are in table 1. In 2009, production of many minerals and mineral materials decreased substantially in response to decreased demand during the economic downturn, and this resulted in unused production capacity in the mineral industry that could be brought quickly into production in 2010 in cases where demand increased. In 2010, production of secondary aluminum was estimated to have decreased compared with that of 2009 (although not back to the level of production in 2008) owing to a decrease in secondary aluminum smelter feed following the termination (on December 31, 2009) of the scrapping bonus paid by the Government for automobiles over 13 years old. (On April 1, 2009, the Government started this program as an economic stimulus measure to help counteract the economic downturn in the country.) According to preliminary data from the International Copper Study Group, Austria's production of secondary refined copper increased by 18% compared with that of 2009. Production of most other metals also increased substantially in response to a recovery in demand both domestically and in Austria's main export markets for metals (mostly in member countries of the EU) following the economic downturn in Europe that began about mid-2008 and lasted until about mid-2009 (table 1; Austrian Times, 2009; Schneeweiss, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 6–14, 68–69; International Copper Study Group, 2011, p. 13, 15; World Steel Association, 2011, p. 3, 63–65, 88, 100).

In 2010, the value of total sales in the construction sector of Austria was about the same as in 2009 (decreased by 0.05%), but 2009 sales in this sector were already 11% lower than in 2008; the value of total output in the construction sector decreased by about 4.7% in 2010 after decreasing by 7.5% in 2009. Thus, domestic demand for minerals used in this sector appeared to have remained relatively low (if not to have decreased further) in 2010, and there were again decreases in

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the country's production of cement, clays, gypsum, sand (other than silica sand) and gravel, and crushed and worked stone (including granite, limestone, marl, and quartzite) in 2010 compared with that of 2009. In 2010, there appeared to be some delays and restructuring of expected public investment in infrastructure and other major construction projects, but the value of active nonresidential construction projects in Austria was expected to increase in 2011 (although not necessarily that of active civil engineering projects). In 2010, the total revenue of Austrian companies in the civil engineering sector decreased by 8.4% compared with that of 2009. The value of exports of worked stone decreased by 33%; cement, 28%; gypsum and wallboard, about 18%; sand and gravel, 6.4%; and ceramic or stone tiles, 3.6%. One reason given for the continuing decreases in the value of Austrian exports of these stone and ceramic minerals and materials was weak demand in Eastern Europe, which appeared to have the greatest effect on the country's exports of worked stone in 2010 (table 1; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 7–14, 68–69; Fachverband der Stein- und Keramischen Industrie Österreich, 2011, p. 7–9, 11–13, 19; HOCHTIEF AG, 2011, p. 43–44; Wirtschaftskammer Österreich, 2011a).

Austria's production of industrial minerals that were used to a greater extent outside of the construction sector, such as industrial abrasives (fused aluminum oxide) and industrial refractories (magnesite), or in the production of technical ceramics for industrial applications (such as ceramics used in electronics) increased for the most part. There appeared to be increases in domestic demand for these minerals and materials, including for refractories in the steel sector, and increases in export demand, mostly from other countries in the EU and especially from Germany. In 2010, production of talc and leucophyllite increased compared with that of 2009 mostly in response to an increase in demand for these minerals in the manufacturing of paper (the main use of Austrian talc) and to lesser increases in demand in the coatings, paints and lacquers, and plastics sectors, but production was still significantly below the levels in 2007 and 2008. Production of some other industrial minerals used primarily in industry (instead of primarily in construction) decreased substantially, including notable decreases in the production of diabase and silica sand. Information concerning the main cause of the decrease in production of either of these last two minerals or in which sector demand may have decreased (for example, whether relative demand for silica sand decreased more in the glass manufacturing sector, in the foundry sector, or in some other sector), however, was not available. The total value of foundry production actually increased by about 26% compared with that of 2009, but this was after it decreased by 32% in 2009 compared with that of 2008. Preliminary data indicate that the value of total sales in the paper and glass sectors increased by about 15% and 5%, respectively, in 2010 compared with that of 2009, and the value of total sales in each of these sectors decreased by about 16% and about 13%, respectively, in 2009 compared with that of 2008 (table 1; Statistik Austria, 2010; 2011a, b; Wilson, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 7–14, 35–42, 72; Fachverband der Gießereiindustrie, 2011, p. 13; Fachverband der Stein- und Keramischen Industrie Österreich, 2011, p. 8–9, 11–14, 19; Feytis, 2011).

Through 2010, production of graphite in Austria exhibited a high amount of volatility since Graphitbergbau Mühldorf Mörth GmbH resumed mining in 2008 after reportedly using only stockpiled material to supply its customers during the past few years. The company continued to invest in expanding output to consistently produce at listed capacity and was planning to continue to invest in this ramping up and possible capacity expansion through at least 2012. Similarly, the large percentage changes in the production of kaolin, mica (estimated), oil shale, and rock salt could be overstating the importance of these changes in terms of tonnage or volume (owing to relatively small bases of production in Austria) and did not involve even regionally significant changes in the tonnages of production for these minerals. Production of kaolin was reported to be negatively affected by decreasing profit margins for producers in Austria owing to the price of kaolin not keeping pace with increases in the costs of production (led by increases in the prices of diesel, other fuels, and freight or transportation). At the same time, kaolin prices may not have increased as much as costs because less costly substitutes could have been more readily available for use in the areas of consumption growth. Austria's production of all types of salt increased owing to increased demand for salt-based deicing compounds during the greater snowfall during January, February, November, and December 2010, compared with that of 2009. Rock salt is more useful for conventional highway deicing applications than brines, which could be a reason for the much greater increase (90%) in rock salt production relative to that of salt from brines. Information was not available concerning the main reason for the 10% increase in production of natural gas in the country, for the even greater percent changes in Austria's production of some petroleum refinery products, or for its production of sulfur as a byproduct of oil and natural gas production and processing (table 1; Roberts, 2010, 2011; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 9–10, 14, 34–36, 43–44, 71–72; Feytis, 2011).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities. Many mineral producers and processors (including most of the producers of industrial minerals in Austria) are not listed in table 2 owing to the lack of availabile information concerning the production capacities of the many small- and medium-scale ("Mittelstand") family-owned companies that produce minerals in the country. In 2010, there were reportedly 1,184 mining and quarrying operations and 3 operations that produced natural gas and (or) crude petroleum. Of the mining operations, 1,181 produced industrial minerals, including 1,165 open pit mines or quarries, 11 underground (nonsalt) industrial mineral mines, and 5 underground salt mines; 2 mines produced iron ore and micaceous iron oxide; and 1 mine produced nonferrous metals (tungsten). Almost all the mineral companies operating in Austria were privately owned, but the Government owned 100% of the currently nonproducing coal company Graz-Koflacher Eisenbahn und Bergbaugesellschaft and 31.5% of the oil and

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gas company OMV Austria Exploration & Production GmbH (table 2; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 13).

Some mid-tier and even larger multinational companies that produced minerals and mineral materials had operations in Austria, including CEMEX S.A.B. de C.V. of Mexico, Holcim Ltd. of Switzerland, Imerys S.A. and Lafarge S.A. of France, Norsk Hydro ASA of Norway, RHI AG of Austria, and Rio Tinto plc of the United Kingdom. Imerys reported that it was the leading producer of at least a few industrial minerals in the world, including of corundum (fused alumina and bauxite) after acquiring all of the shares of Treibacher Schleifmittel AG of Austria in 2002 (table 2; Imerys S.A., 2011, p. 5–6).

On June 18, 2010, One Equity Partners (an investment division of JPMorgan Chase & Co. of the United States) acquired 91% of the direct ownership shares of Constantia Packaging AG from Constantia Packaging B.V. of the Netherlands. Constantia Packaging AG held a 90% interest in Austria Metall GmbH (AMAG). By August 3, Salzburger Sand- & Kieswerke GmbH had acquired Moldan Baustoffe GmbH & Co. KG from CONNEXIO alternative investment holding AG of Austria. Voestalpine Stahl GmbH was the leading producer of lime in Austria and is now included in table 2 as a lime producer. Zementwerk LEUBE GmbH reported 130,000 metric tons (t) of lime production in 2009 and 126,000 t in 2010, but information concerning the lime production capacities for this company or any other company besides voestalpine Stahl in Austria was not available (table 2; One Equity Partners, 2010; pressetext Nachrichtenagentur GmbH, 2010; voestalpine Stahl GmbH, 2011, p. 8; Zementwerk LEUBE GmbH, 2011).

Commodity Review

Metals

Aluminum.—AMAG was the leading producer of semifinished and cast aluminum products in Austria. In addition to the company's production of secondary aluminum in the country, the company sourced primary aluminum for its manufacturing operations in Austria through its 20% interest in Aluminerie Alouette Inc. of Canada. Many of the secondary aluminum producers in Austria had close ties with automobile manufacturers (including some in Germany), and it was estimated that a significant share of secondary aluminum production in the country relied on the automobile sector for scrap aluminum feedstock and sales of aluminum. Austrian aluminum producers also supplied aluminum metal, alloys, and other products to a diverse set of customers, including in the aviation, construction, electrical, machine tools, other transportation, and packaging sectors, as well as aluminum for the manufacture of end-use goods, such as sporting equipment (table 2; Constantia Packaging AG, 2010, p. 33–37; Pawlek, 2010; AMAG Holding GmbH, 2011, p. 7, 36–37, 53; Norsk Hydro ASA, 2011, p. 4, 41–43).

Iron and Steel.—Voestalpine AG was by far the leading producer of crude steel in Austria. The company was considering increasing the percentage of domestically produced iron ore in the volume of raw material it used to manufacture crude steel in the country from about 25% to about 30% because the cost of purchasing the iron ore from external sources had reportedly become significantly higher than the cost of increasing the domestic production of VA Erzberg GmbH (subsidiary of voestalpine AG). In 2010, Austria's production of iron ore increased by about 3% compared with that of 2009, the country's imports of iron ore and concentrates increased by about 53% [by 3.2 million metric tons (Mt)], and its exports of iron ore and concentrates were a negligible percentage of production (amounting to only 22 t in 2009 and 9 t in 2010). Austria's production of crude steel increased by about 27% during this same timeframe, so it does not appear that the proportion of domestically produced iron ore in the total amount of iron ore used in the country could have increased in 2010 compared with that of 2009. During 2010, voestalpine was considering construction of a pellets plant to increase the output of marketable iron ore at the company's Erzberg Mine, but it was decided in November that the project was not feasible primarily owing to the expected high costs of the emissions permits that would be necessary to operate the new plant. Sales to the automotive sector accounted for the leading share (about 28%) of total revenues for voestalpine, including about 31% of the revenues of the company's steel division, and it experienced growth in sales to every sector except to the construction sector in 2010 compared with sales in 2009 (table 1; Schneeweiss, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 31–32, 68; voestalpine AG, 2011, p. 3, 24–27, 39, 52–58).

Industrial Minerals

Abrasives.—Worldwide, Treibacher Schleifmittel reportedly had a brown fused alumina production capacity of between 200,000 metric tons per year (t/yr) and 250,000 t/yr and a white fused alumina capacity of about 100,000 t/yr. Both brown and white fused alumina can be used in either abrasives or refractories, and information was not available concerning for which application the company's Austrian production of fused alumina was predominantly used. The company also had a research facility in Villach to develop and improve mineral products to be used in abrasives, refractories, and technical ceramics (table 1; Imerys S.A., 2011, p. 16–17, 20–24; Roberts, 2011).

Clay and Shale.—Wienerberger AG was the leading producer of bricks (and clay blocks) in the world, and the leading producer of clay roofing tiles in Europe. The company experienced a 25% decrease in earnings in 2009 compared with that of 2008, but only a 4% decrease in 2010 compared with that of 2009 owing to company restructuring. The percentage decrease in Wienerberger's revenue in 2009 is very similar to the percentage decrease in Austria's (tonnage) production of unspecified clays during the same timeframe, although sales in Austria accounted for only about 5% of company revenue in 2010. Its decreasing revenue was mostly owing to decreases in new residential construction in most (if not all) of the regional markets for Wienerberger. The Eastern European market accounted for the leading share (25%) of company revenues in 2010. Because the Wienerberger revenue stream was highly dependent on new residential construction and because the fiscal

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stimulus plans were expected to focus on infrastructure projects, the company was not expected to benefit much from planned government stimulus programs in the company's major markets (table 1; Hammond, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 35–40; Wienerberger AG, 2011, p. 1, 34, 45–46, 60–61, 72).

Magnesium Compounds.—In 2010, RHI benefited from the increase in steel production (in Austria and elsewhere) compared with that of 2009. The steel manufacturing sector annually accounted for about 60% or more (64% in 2010) of the company's revenues (from the sale of refractory products), and RHI fully or partially participated in the refractories management of other companies' steel manufacturing facilities through full-line service contracts. The company planned to increase its production of magnesium compounds to account for 80% of the raw materials it uses to produce refractory products compared with 30% in 2010, but the company's only magnesite mine and plant expansion that was started in 2010 was a designed 80,000-t/yr expansion of magnesite production capacity at its Eskisehir site in Turkey. Further RHI magnesite mine and plant expansion projects, possibly including at the company's magnesite production sites in Austria, were still being evaluated through the end of 2010 (table 1; O'Driscoll, 2010; Wilson, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 36–37; RHI AG, 2011, p. 3–13, 26–27, 30–36).

Sand and Gravel.—In Austria, diabase was used primarily in construction and was especially useful in road and railway construction. The basaltic mineral material also had some industrial uses, however, including in filtering materials (useful owing to its lack of chemical reactivity) and in the production of antifreezing materials. In 2010, ASAMER Holding AG announced that it was producing basaltic fibers at a company plant in Ebensee (Austria) for various industrial uses, including use in place of glass fibers in such industrial applications as the manufacturing of blades for wind turbines. Almost all the silica sand produced in Austria was used domestically, and the two leading silica-demand sectors in the country appeared to be the foundry and glass manufacturing sectors. Because foundry production in the country increased in 2010, the decrease in production of silica sand could have been primarily owing to a decrease in demand from the glass manufacturing sector; however, specific information concerning trends in potential nonfoundry silica-demand sectors in Austria was not available (table 1; ASAMER Holding AG, 2011, p. 34–35; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 9–10, 35–36, 40–41, 68–72; Fachverband der Gießereiindustrie, 2011, p. 13; Fachverband der Stein- und Keramischen Industrie Österreich, 2011, p. 9–14, 20–23; Diabaswerk Saalfelden GmbH, undated).

Outlook

In 2010, VA Erzberg planned to increase production of iron ore (gross weight) to 2.15 Mt in 2011. Based upon data through October 2011, Austria was expected to increase production of crude steel to about 7.8 Mt in 2011. If Austria's production of specialty steels increases as well, then the country's production of ferroalloys (including the nickel content of ferroalloys) could increase in 2011 compared with that of 2010. Although Wolfram Bergbau- und Hütten- GmbH Nfg. KG reportedly invested in exploration in 2010, this exploration was expected to result in an extension of the life of the Mittersill Mine but not in an increase of annual production of tungsten there, so the mine's production of tungsten was expected to remain about the same in 2011 (Schneeweiss, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 32–33; voestalpine AG, 2011, p. 52–53; World Steel Association, undated).

In 2011, global demand for fused alumina for use in both refractories and abrasives was expected to reach a level similar to that of 2008 after being significantly lower in 2009 and 2010. Excess capacity was estimated to be available to increase production of fused alumina at Treibacher Schleifmittel's facilities in Austria in response to increases in demand, but the primary issue would be obtaining a sufficient feedstock of abrasive-grade calcined bauxite (for production of brown fused alumina) to be able to increase production readily. The availability of calcined alumina (for production of white fused alumina) was much greater in Europe (including in Austria), which is why Europe accounted for a majority of the world's production of white fused alumina. (China reportedly accounted for about 70% of the world's production of brown fused alumina.) So, if the apparent excess capacity at Treibacher Schleifmittel's facilities in Austria could be used to increase production of white fused alumina, then Austria's total production of fused alumina could be expected to increase significantly in 2011. Although information concerning the proportion of Austria's fused alumina production capacity that is capable of being used to produce white fused alumina was not available, it is expected that Austria could produce about 15,000 t in 2011, which is equivalent to the country's estimated level of production in 2008 (table 1; Imerys S.A., 2011, p. 20–24, 60–65; Roberts, 2011).

Although a new public investment program in road and railroad construction projects from 2011 through 2016 was announced by Austria's Ministry of Transportation in November 2010, construction activity in the civil engineering sector did not improve much if at all during the first half of 2011. Commercial (industrial) construction and other structural engineering construction projects could increase moderately in 2011, and the Government planned to subsidize thermal refurbishment of (commercial) buildings through 2014. Residential construction in Austria was expected to continue to decrease (by about 4%) in 2011, however, because building permits for construction of both single family homes and multistory accommodation units were expected to decrease compared with the number of permits granted in 2010. The net effect of these demand trends and Government programs on Austria's production of industrial minerals used in construction was not certain, but the country's production of most construction minerals could decrease again in 2011. In 2012 (and beyond), however, Government programs were expected to have a more noticeable effect in improving demand for industrial minerals used in construction, and on Austria's production of these minerals and mineral products, possibly including cement, clays (such as brick clay and clays used in manufacturing ceramics for buildings and households), diabase, gypsum, construction sand and gravel, and stone

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(Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 34–36; Fachverband der Stein- und Keramischen Industrie Österreich, 2011, p. 7–12, 19).

Investment in increasing and stabilizing Austria's production of mined graphite was expected to continue in 2011 and 2012, possibly including production by Grafitbergbau Kaisersberg GmbH at the company's Kaisersberg Mine, but accurate information concerning the expected quantitative effects of this investment on the country's production of graphite or expected timelines for any resulting increases in production was not available. Only slight increases in the price of kaolin were expected for 2011, and the cost of kaolin mining in Austria was expected to increase more than the price of kaolin output. As a result, the country's production of kaolin in 2011 was not expected to increase significantly compared with that of 2010. In 2011, the value of industrial production in Austria was expected to increase by 7% compared with that of 2010, so production of industrial minerals used predominantly in the industrial sector could increase significantly in cases where there is excess capacity in the country to produce those minerals (Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 34–36; Fachverband der Stein- und Keramischen Industrie Österreich, 2011, p. 7–12, 19).

Occasional market shortages of magnesite are expected in 2011 and beyond, reportedly owing at least partially to export taxes, quotas, and a licensing system being implemented in China to limit exports. (China was estimated to have accounted for about 57% of world production of magnesite in 2010.) RHI and other magnesite producers were expected to increase production in 2011 by activating unused production capacities, but a significant expansion of RHI's magnesite production capacity was not expected until sometime in 2012 (and even then, it would still probably not be in Austria). Magnesite producers in the country were estimated to have some excess magnesite production capacity that could be more fully utilized as the market demands. So, producers of magnesite and magnesia in Austria were expected to increase production to about 800,000 t of crude magnesite in 2011, and actual production could be even closer to their combined 2008 level of production of crude magnesite of about 840,000 t of crude magnesite (table 1; O'Driscoll, 2010; Wilson, 2010; Bundesministerium für Wirtschaft, Familie und Jugend, 2011, p. 36–37; Kramer, 2011; RHI AG, 2011, p. 37–38).

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TABLE 1
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum, metal, secondary[e]	metric tons	150,000	150,000	158,958 [r,2]	282,944 [r,2]	250,000
Copper, metal, secondary:						
Smelter	do.	65,900	80,200	94,200	90,800	92,200 [p]
Refined	do.	72,600	81,400	106,700	96,200	113,700 [p]
Iron and steel:						
Iron ore, including micaceous iron oxide:						
Gross weight		2,092 [r]	2,153	2,033	2,002 [r]	2,069
Fe content		669	689	650	641 [r]	662 [e]
Metal:						
Pig iron		5,547	5,908 [r]	5,795 [r]	4,353 [r]	5,621
Ferroalloys, electric arc furnace, gross weight[e,3]	metric tons	14,000	14,000	14,000	12,700 [r]	14,500
Crude steel		7,129	7,578	7,594	5,662	7,206
Semimanufactures, hot-rolled products		6,495	6,816	6,850	5,394 [r]	6,621
Lead, refined, secondary	metric tons	28,120	28,564	26,902	22,197 [r]	25,499
Manganese, Mn content of domestic iron ore[e]	do.	16,000	15,000	15,000	15,000 [r]	15,000
Nickel, including Ni content of ferroalloys[e]	do.	900	900	800	700	600
Tungsten ore and concentrate:						
Ore:						
Gross weight	do.	400,182	435,006	434,296	344,851 [r]	429,748
W content[e]	do.	1,310	1,270	1,250	1,040 [r]	1,300
Concentrate:						
Gross weight	do.	3,949	4,343	4,627	3,436	3,812
W content	do.	1,153	1,117	1,122	887 [r]	1,140 [e]
INDUSTRIAL MINERALS						
Aluminum oxide, fused[e]	metric tons	15,000	15,000	15,000	10,000	11,500
Cement:						
Clinker		3,654	3,992	3,996 [r]	3,428 [r]	3,097
Hydraulic		4,886 [r]	5,203	5,309	4,646 [r]	4,254
Clays:						
Kaolin, crude	metric tons	51,900	56,690	49,527	83,980 [r]	58,956
Unspecified, possibly including bentonite, brick clay and illite		2,868	2,465 [r]	2,473 [r]	1,866 [r]	1,860
Diabase (of basaltic rocks)		1,885	2,372 [r]	2,410 [r]	2,098 [r]	1,762
Feldspar, byproduct of silica processing[e]	metric tons	27,000	27,000	27,000	27,000	27,000
Graphite, crude	do.	--	--	250	750 [r]	420
Gypsum and anhydrite, crude		1,071	1,064 [r]	1,087	911 [r]	872
Lime, including quicklime		473	497	909	725 [r]	740 [e]
Of which, marketed		465	491	612	507 [r]	517 [e]
Magnesite:						
Crude		769	812	837	545 [r]	757
Sintered or dead burned		270	288	290	230 [r]	264
Caustic calcined		98	51	50	21 [r]	52
Mica, possibly including iron oxide (pigment)[e,4]	metric tons	3,160	3,510	3,420	2,840	3,420
Nitrogen, N content of ammonia[e]		400	380 [r]	400	370 [r]	400
Salt (NaCl):						
Brines, gross	thousand cubic meters	3,451	2,468 [r]	2,912 [r]	3,460 [r]	3,608
Evaporated, mechanical heating process		764	726	867	1,035 [r]	1,072
Rock	metric tons	1,446	1,172	503	50 [r]	95
Mine output, NaCl content		807	742	874 [r]	1,038 [r]	1,083
Sand and gravel:						
Dolomite, loose rocks and gravel		--	3,212	3,151	2,790	2,620
Quartz (silica) sand		2,008	1,915 [r]	2,175 [r]	1,200 [r]	939
Sand and gravel, unspecified		18,995	26,825 [r]	27,718 [r]	25,722 [r]	24,128

See footnotes at end of table.

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TABLE 1—Continued
AUSTRIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Sodium compounds, manufactured, n.e.s.:[e, 5]						
Soda ash		100	100	100	100	100
Sulfate		100	100	100	100	100
Stone:						
Amphibolite		667	1,693 r	1,808 r	1,780 r	1,670
Basalt, not included in diabase		1,947	1,905 r	1,797 r	1,744 r	1,473
Dolomite		3,411	4,452 r	4,409 r	3,967 r	3,915
Gneiss		513	1,526 r	1,668 r	1,431 r	1,505
Granite and granulite		2,503	2,577 r	3,315 r	3,078 r	2,340
Limestone, including marble		21,535 r	22,820 r	23,758 r	22,074 r	21,190
Marl		2,062	2,115	1,826	1,508 r	1,149
Quartz, quartzite, and pegmatite		290	311 r	327 r	377 r	294
Serpentinite		1,658	1,869	1,690	1,751	2,013
Other, including conglomerate and sandstone		14	48 r	61 r	22 r	38
Sulfur, byproduct of petroleum and natural gas	metric tons	10,166	10,786	8,016	12,007 r	9,873
Talc and leucophyllite (white mica), crude	do.	159,447	153,409	154,577	111,388 r	138,367
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite		8	--	--	--	--
Coke		1,283	1,422	1,410	1,281 r	1,388
Natural gas:						
Marketable (net)	million cubic meters	1,765	1,835	1,544	1,559 r	1,713
Natural gas liquids[6]	thousand 42-gallon barrels	919	868	836	972 r	927
Oil shale	metric tons	287	4	114	144 r	176 r
Petroleum:						
Crude[7]	thousand 42-gallon barrels	6,028	6,009	6,066	6,371	6,167
Refinery products:[6]						
Liquefied petroleum gas	do.	578 r	813	1,134	1,068 r	1,011
Gasoline	do.	13,800 r	14,500 r	14,400	14,100 r	12,300
Kerosene and jet fuel	do.	4,180 r	4,800 r	3,750 r	2,480 r	3,780
Distillate fuel oil	do.	6,830 r	5,760 r	5,280	5,870 r	6,970
Residual fuel oil	do.	6,690 r	4,050 r	6,600	5,540 r	5,070
Unspecified	do.	36,500 r	39,600 r	39,600 r	35,600 r	31,700
Refinery fuel and losses	do.	243	173	154	824 r	316
Total	do.	68,821 r	69,696 r	70,918 r	65,482 r	61,147

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through December 2, 2011.

[2]Reported figure.

[3]May include ferromolybdenum, ferronickel, ferronickelmolybdenum, and (or) ferrovanadium.

[4]Production not reported separately from that of iron ore, so estimated from reported exports minus imports of mica.

[5]Not elsewhere specified.

[6]Figure converted to barrels from metric tons according to a converson factor and reflects the significant digits of the conversion factor.

Source: U.S. Energy Information Administration, 2008, International Energy Annual—Table C.1, General Conversion Factors: Washington, DC, U.S. Energy Information Administration. June-December. (Accessed March 7, 2010, at http://www.eia.doe.gov/emeu/iea/tablec1.html.)

[7]All figures were converted to barrels from metric tons according to a converson factor of 7.040 barrels of crude oil per metric ton. Source: U.S. Energy Information Administration, [undated], International Energy Statistics—Austria: Washington, DC, U.S. Energy Information Administration. (Accessed March 7, 2010, at http://tonto.eia.doe.gov/cfapps/ipdbproject/IEDIndex3.cfm?tid=94&pid=57&aid=32.)

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TABLE 2
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, fused	Treibacher Schleifmittel GmbH (Imerys S.A., 100%)	Plant at Villach, State of Carinthia	60
Aluminum	Hammerer Aluminium Industries GmbH	Secondary plant at Ranshofen, State of Upper Austria	80
Do.	Hydro Aluminium Nenzing GmbH (Norsk Hydro ASA, 100%)	Secondary plant at Nenzing, State of Vorarlberg	59
Do.	Austria Metall GmbH (Constantia Packaging AG, 90%, and AMAG Arbeitnehmer Privatstiftung, 10%)	Secondary ingot plant at Ranshofen, State of Upper Austria	50
Do.	Speedline Aluminium Giesserei GmbH (Swiss Alu Trading AG, 100%)	Secondary plant at Schlins, State of Vorarlberg	49
Do.	Aluminum Lend GmbH (Salzburger Aluminium AG, 100%)	Secondary ingot plant at Lend, State of Salzburg	40
Do.	NEUMAN Aluminium Austria GmbH (CAG Holding GmbH, 100%)	Secondary plant at Marktl, State of Styria	16
Do.	Bavaria Industriekapital AG	Secondary plant at Gleisdorf, State of Styria	NA
Do.	Georg Fischer Automotive AG	Secondary plant at Altenmarkt, State of Salzburg; Secondary plant at Herzogenburg, State of Lower Austria	NA
Do.	Nemak Linz GmbH (Tenedora Nemak S.A. de C.V., 100%)	Secondary plant at Linz, State of Upper Austria	NA
Do.	Almaxal Brüder Tschirk GmbH	Secondary plant at Neudörfl, State of Burgenland	NA
Do.	Almeta Metallumschmelzwerk GmbH	Secondary plant at Vienna; secondary plant at Sollenau, State of Lower Austria	NA
Cement	Lafarge Perlmooser AG (Lafarge S.A., 100%)	Plant at Mannersdorf, State of Lower Austria; plant at Retznei, State of Styria; grinding plant at Kirchbichl, State of Tirole	2,200
Do.	Wietersdorfer & Peggauer Zementwerke GmbH	Plant at Peggau, State of Styria; Plant at Wietersdorf, State of Carinthia	900
Do.	Gmundner Zement Produktions- und Handels GmbH	Plant at Gmundnen, State of Upper Austria	800
Do.	Kirchdorfer Zementwerk Hofmann GmbH	Plant at Kirchdorf, State of Upper Austria	800
Do.	Zementwerk LEUBE GmbH	Plant at Gartenau, State of Salzburg	770
Do.	Wopfinger Baustoffindustrie GmbH	Plant at Wopfing, State of Lower Austria	300
Do.	Holcim (Wien) GmbH (Holcim Ltd., 100%)	Plant at Vienna	300
Do.	Holcim (Vorarlberg) GmbH (Holcim Ltd., 100%)	Lorüns grinding plant and cement plant at Bludenz, State of Vorarlberg	200
Clays, including brick clay	Wienerberger AG	Clay mines at Göllersdorf, State of Lower Austria; at Rotenturm and Stoob, State of Burgenland; and at Apfelberg and Weißkirchen, State of Styria	NA
Clays, kaolin, and silica sand	Österreichische Kaolin- und Montanindustrie AG	Mines at Weinzierl and Kriechbaum; processing plant at Aisthofen, State of Upper Austria	170
Coal	Graz-Koflacher Eisenbahn und Bergbaugesellschaft GmbH (Government, 100%)	Oberdorf Mine, Bärnbach, State of Styria (closed)	1,200
Copper, refined, secondary	Montanwerke Brixlegg AG (A-Tec Industries AG, 100%)	Plant at Brixlegg, State of Tirole	110
Diabase, basalt	Diabaswerk Saalfelden GmbH (STRABAG SE, 100%)	Mine and plant at Saalfelden, State of Salzburg	NA
Do.	Klöcher Basaltwerke GmbH & Co KG (ASAMER Holding AG, 100%)	Mines and plants at Klöch and Oberhaag, State of Styria	NA
Feldspar	Quarzwerke Österreich GmbH (Quarzwerke GmbH, 100%)	Mine and plant at St. Georgen an der Gusen, State of Upper Austria	NA
Ferroalloys, FeV, FeMo, FeNi	Treibacher Industrie AG	Plant at Althofen, State of Styria	10
Graphite, natural	Graphitbergbau Mühldorf Mörth GmbH	Trandorf Mine at Weinberg and extended to Weinbergwald, State of Lower Austria; mine at Eichenwald, State of Styria	15
Do.	Grafitbergbau Kaisersberg GmbH	Kaisersberg Mine, State of Tirole	3

See footnotes at end of table.

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TABLE 2—Continued
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Gypsum and anhydrite, natural	Moldan Baustoffe GmbH & Co. KG (Salzburger Sand- & Kieswerke GmbH, 100%)	Abtenau and Moosegg Mines, near Kuchl bei Hallein, State of Salzburg	300
Do.	Saint-Gobain Rigips Austria GmbH (Compagnie de Saint-Gobain, 100%)	Mine at Grundlsee and main plant at Bad Aussee, State of Styria; Mine and plant at Puchberg, State of Lower Austria	250
Do.	Knauf GmbH	Hinterstein Mine, Spital am Pyhrn, State of Upper Austria; Mines at Dörfelstein and Tragöß-Oberort, and plant at Weißenbach bei Liezen, State of Styria	160
Do.	Gipswerk Schretter & Cie. GmbH	Mine at Weißenbach am Lech and plant at Vils, State of Tirole	NA
Iron ore	VA Erzberg GmbH (voestalpine AG, 100%)	Erzberg Mine at Eisenerz, State of Styria	3,000
Iron oxide, micaceous	Kärntner Montanindustrie GmbH	Mine near Waldenstein, State of Carinthia	NA
Lead	Bleiberg Bergwerks-Union AG (Metall Gesellschaft, 74%)	Smelter at Brixlegg, State of Tirole	55
Lime	voestalpine Stahl AG (voestalpine AG, 100%)	Limestone mine near Kremsmauer mountain, and plant at Steyrling, State of Upper Austria	360
Do.	Zementwerk LEUBE GmbH	Plant at Gartenau, State of Salzburg	150 e
Magnesite, crude	Veitsch-Radex GmbH & Co. (RHI AG, 100%)	Mine and plant at Breitenau, State of Styria; Mine at Eichberg, State of Lower Austria; Am Bürgl Mine, area near Weissenstein, State of Tirole; mine and processing plant at Millstätter Alpe, State of Carinthia	800
Do.	Styromagnesit Steirische Magnesitindustrie GmbH	Angerer, Kaintaleck and Wieser Mines, and plant near Oberdorf an der Laming, State of Styria; Wald Mine in the Schoberpass, State of Styria	75
Do.	CEMEX Austria AG (CEMEX S.A.B. de C.V., 100%)	Mine and plant at Veitsch, State of Styria	NA
Do.	PRONAT Steinbruch Preg GmbH (Schotter- und Betonwerk Karl Schwarzl Betriebsgesellschaft m.b.H., 100%)	Magnesite and dunite (olivine rock) mine at Gulsen, and plant at Preg, State of Styria	NA
Natural gas million cubic meters	OMV Austria Exploration & Production GmbH [OMV Aktiengesellschaft (Free floating shares, 48.5%; Government, 31.5%; International Petroleum Investment Co. 20%), 100%]	Main fields in the Vienna Basin, State of Lower Austria, and some fields in the State of Upper Austria	1,500
Do. do.	Rohöl-Aufsuchungs Aktiengesellschaft (EVN AG, 50.025%; E.ON Ruhrgas E&P GmbH, 29.975%; Steirische Gas-Wärme GmbH, 10%; Salzburg AG, 10%)	Main fields in the State of Upper Austria, and some fields in the State of Lower Austria and the State of Salzburg	550 e
Nitrogen, N content of ammonia	Agrolinz AG	Plant at Linz, State of Upper Austria	498
Oil shale	Tiroler Steinölwerke Albrecht GmbH & Co. KG	Mine in the Bächental, near Pertisau am Achensee, State of Tirole	NA
Petroleum, crude thousand 42-gallon barrels	OMV Austria Exploration & Production GmbH [OMV Aktiengesellschaft (Free floating shares, 48.5%; Government, 31.5%; International Petroleum Investment Co., 20%), 100%]	Main fields in the Vienna Basin, State of Lower Austria, and some fields in the State of Upper Austria	5,500 e
Do. do.	Rohöl-Aufsuchungs Aktiengesellschaft (EVN AG, 50.025%; E.ON Ruhrgas E&P GmbH, 29.975%; Steirische Gas-Wärme GmbH, 10%; Salzburg AG, 10%)	Main fields in the State of Upper Austria, and some fields in the State of Lower Austria and the State of Salzburg	750 e
Salt, NaCl content	Salinen Austria AG	Mines at Bad Ischl and Hallstatt, and evaporite saltworks at the Ebensee, State of Upper Austria; mine at Hallein-Dürrnberg, State of Salzburg; mine at Hall in Tirol, State of Tirole; mine at Altaussee, State of Styria	1,100

See footnotes at end of table.

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TABLE 2—Continued
AUSTRIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Silica sand	Krempelbauer-Quarzsandwerk St. Georgen Hentschläger & Co. KG.	Burger and Knoll-Wizany Mines at Luftenberg, Krempelbauer and Poscher Mines at St. Georgen, and Treffling Mine at Aigen-Engerwitzdorf, State of Upper Austria	NA
Do.	Quarzwerke Österreich GmbH (Quarzwerke GmbH, 100%)	Mine and plant at Melk, State of Lower Austria; mine and plant at St. Georgen an der Gusen, State of Upper Austria	NA
Do.	Quarzsande GmbH (Zementwerk LEUBE GmbH, 100%)	Mine and plant at Eferding, mine at Bruck-Waasen, and mine at Wolfsegg, State of Upper Austria	NA
Steel, crude	voestalpine Stahl GmbH (voestalpine AG, 100%)	Plant at Linz, State of Upper Austria	6,000
Do.	voestalpine Stahl Donawitz GmbH Co & KG (voestalpine AG, 100%)	Plant at Donawitz, State of Styria	1,500
Do.	Breitenfeld Edelstahl AG	Plant at Mitterdorf im Mürztal, State of Styria	300
Do.	Böhler Edelstahl GmbH & Co KG (voestalpine AG, 100%)	Plant at Kapfenberg, State of Styria	150 e
Talc and leucophyllite (white mica)	Naintsch Mineralwerke GmbH (Rio Tinto plc, 100%)	Talc mines at Lassing and Rabenwald, and plant at Oberfeistritz, State of Styria; talc and mica mine at Kleinfeistritz, and a plant at Weisskirchen, State of Styria	200 e
Do.	Aspanger Bergbau und Mineralwerke GmbH & Co. KG (Wietersdorfer & Peggauer Zementwerke GmbH, 100%)	Leucophyllite mine and mica processing plant at Aspangberg-Zöbern, State of Lower Austria	NA
Tungsten:			
Ore (scheelite), gross weight	Wolfram Bergbau- und Hütten- GmbH Nfg. KG (Sandvik AB, 100%)	Mine at Mittersill and processing plant in the Felbertauerntal, State of Salzburg	475 e
Carbide, metal, and oxide powders	do.	Primary and secondary chemical treatment and sintering plant at St. Martin, in the Sulmtal, State of Styria	NA

eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

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The Mineral Industry of Azerbaijan

By Elena Safirova

Azerbaijan produced a wide range of metals and industrial minerals, including such metals as alumina, aluminum, iron ore, and steel. Its major importance as a world mineral producer, however, was based on its crude oil extracting industry. The country had been a significant crude oil producer for more than a century, but the focus since independence in 1991 was on developing offshore resources in the Caspian Sea. Oilfield and gasfield development was concentrated in two projects—the Azeri-Chirag-Guneshli (ACG) offshore oilfield complex and the Shah-Deniz offshore gas condensate field (U.S. Department of State, 2012; U.S. Energy Information Administration, 2012).

Minerals in the National Economy

In 2010, the real gross domestic product (GDP) of Azerbaijan increased by 5%. Although the 5% corresponds to a respectable rate of growth, this rate was much lower than the rates observed in the previous decade, when in every year growth rates were above 9%. In 2010, mining and quarrying accounted for 49.2% of the country's GDP. Almost all the output in the mining and quarrying sector was derived from the production of crude oil and natural gas (State Statistical Committee of the Republic of Azerbaijan, 2011; U.S. Central Intelligence Agency, 2012).

In 2010, Azerbaijan exported about $26.5 billion worth of goods and services. More than 90% of export revenues came from crude oil and natural gas; other export commodities were cotton, foodstuffs, and machinery. The main export partners of Azerbaijan in 2010 were Italy (which received 26.8% of Azerbaijan's total exports), the United States (8.4%), Germany (7.1%), France (6.7%), the Czech Republic (4.9%), and Russia (4.4%). Azerbaijan's total imports in 2010 were valued at about $6.8 billion, and the main imported commodities included chemicals, foodstuffs, machinery and equipment, metals, and petroleum products. The country's major imports partners in 2010 were Turkey (which provided 17.7% of Azerbaijan's imports), Russia (14.5%), Germany (9.9%), China (9.6%), the United Kingdom (7.2%), and Ukraine (7.0%). With net exports of almost $20 billion, Azerbaijan was able to continue investing in infrastructure, stabilizing the economy, and reducing poverty in the country (State Statistical Committee of the Republic of Azerbaijan, 2011; U.S. Central Intelligence Agency, 2012).

Production

Data on mineral production are in table 1.

Structure of the Mineral Industry

State Oil Company of Azerbaijan Republic (SOCAR) was state owned. It produced crude oil and natural gas in Azerbaijan, operated the country's two refineries, and ran Azerbaijan's pipeline system. The Ministry of Industry and Energy, however, handled exports and oversaw exploration, development, and production agreements with foreign companies. SOCAR had been a party to all international consortia involved in developing crude oil and natural gas projects in Azerbaijan. On its own, SOCAR produced less than 20% of Azerbaijan's total crude oil output; the remainder was produced by the Azerbaijan International Operating Co. (AIOC). AIOC was a consortium of 10 petroleum companies that had signed extraction contracts with the Government. AIOC was led by BP p.l.c. of the United Kingdom, which was the major foreign investor and had been active in Azerbaijan since 1992. AIOC had made significant direct investments in the development of the ACG fields, as well as the construction of the Baku-Tbilisi-Ceyhan (BTC) pipeline (State Oil Company of Azerbaijan Republic, 2012; U.S. Energy Information Administration, 2012).

Many AIOC members were also involved in the consortium for the development of the Shah-Deniz gasfield. BP and Statoil ASA of Norway were the operators of the Shah-Deniz gasfield development project and held the largest shares (25% each) in the Shah-Deniz consortium. Other shareholders included OAO Lukoil of Russia, Oil Industries' Engineering and Construction (OIEC) of Iran, SOCAR, and Total S.A. of France, each of which had a 10% stake, and Türkiye Petrolleri A.O. (TPAO) of Turkey, which had a 9% stake (U.S. Energy Information Administration, 2012).

Azerigaz Production Union, which was a subsidiary of SOCAR, was responsible for natural gas processing, transport, distribution, and storage, mainly in the domestic market. Azneft Production Union (another SOCAR subsidiary) was responsible for exploration, development, and production from the older onshore and offshore natural gasfields owned directly by SOCAR (U.S. Energy Information Administration, 2012).

Commodity Review

Metals

Gold.—In 2009, Anglo Asian Mining PLC of the United Kingdom began gold production at the Gedabek gold and copper mine, which is located about 55 kilometers (km) from the city of Ganca. In 2010, the company reported producing 1.9 metric tons (t) of gold. Anglo Asian was controlled by R.V. Investment Group Services, and the Azerbaijan Government owned a 49% stake. Anglo Asian held licenses to six gold fields in Azerbaijan, which had the potential to yield 400 t of gold, 2,500 t of silver, and 1.5 million metric tons (Mt) of copper. The Government projected that, by 2014, Azerbaijan's gold production would increase by sixfold (Interfax.com, 2010; Trend.az, 2010; Reuters-UK, 2011).

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Mineral Fuels

Natural Gas.—In 2010, Azerbaijan produced 16,672 million cubic meters of natural gas. The production level increased by 2.1% compared with that of 2009. As of January 2011, according to Oil and Gas Journal, Azerbaijan's gas reserves were approximately 30 trillion cubic feet (about 850 billion cubic meters). Almost all Azerbaijani gas was produced in two offshore fields—the ACG complex and the Shah-Deniz field.

Azerbaijan's future natural gas production increases were expected to come from the continued development of the Shah-Deniz field. Phase 1 of the field's development began producing in 2006, and in 2010, the field produced 6.9 billion cubic feet of gas and 15 million barrels of gas condensate. The full field development was expected to start producing in 2017. The peak capacity of the entire field was projected to be almost triple that of phase 1. Eventually, the Shah-Deniz field would be able to supply European markets with natural gas (U.S. Energy Information Administration, 2012).

Petroleum.—In 2010, the volume of crude oil production in Azerbaijan remained essentially unchanged compared with the 2009 level, increasing by only 0.3%. The country's largest hydrocarbon basins are located offshore in the Caspian Sea. The largest field is the ACG, which produced almost 80% of Azerbaijan's total crude oil output in 2010. The ACG field is located 62 miles (99.78 kilometers) east of Baku in the Caspian Sea and covers 430 square kilometers. The ACG field has an estimated 5 billion barrels of reserves; it produced mostly Azeri Light, which is a medium-light and sweet crude that is valued for its middle-distillate yield (U.S. Energy Information Administration, 2012).

Azeri crude oil is refined domestically at two refineries, the Baku refinery and the New Baku refinery. The total refining capacity of both refineries is about 400 billion barrels per day. Both refineries are in need of modernization that may cost $600 to $700 million. In 2010, only a small fraction of the crude oil was being refined at local refineries. Most of the crude oil export was transported using pipelines. Azerbaijan has three export pipelines—the Baku-Tbilisi-Ceyhan (BTC), the Baku-Novorossiysk, and the Baku-Supsa—and about 80% of the petroleum was exported through the BTC pipeline (U.S. Energy Information Administration, 2012).

Outlook

Azerbaijan's high economic growth from 2006 through 2008, which was fueled by increased crude oil exports, opened new opportunities for the country. Many problems and obstacles still remained, however. Pervasive corruption, structural economic inefficiencies, and the need for increased foreign investments in the nonenergy sector continued to slow down the economic growth. The country's future will depend largely on whether Azerbaijan's leadership is able to use the natural gas and petroleum profits to build a solid economic foundation for the country. It will also depend on gas and oil prices, the location of new pipelines in the region, and the overall situation in the world economy (U.S. Central Intelligence Agency, 2012).

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TABLE 1

AZERBAIJAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Alumina		362,665	184,483	164,879	9,600 r	--
Aluminum, primary and secondary		31,852	39,241	61,607	30,000	30,000 e
Copper		--	--	--	--	184
Gold	kilograms	--	--	--	333	1,900
Iron ore, marketable:						
Gross weight		11,300	17,600	28,100	--	57,800
Fe content[e]		5,650	8,800	14,900	--	32,900
Silver	kilograms	--	--	--	--	1,500
Steel:						
Crude		54,309	273,393	74,800 r	78,874 r	129,124
Pipes		14,108	25,706	28,196	6,918 r	36,545
INDUSTRIAL MINERALS						
Bentonite		40,644	50,459	40,700	10,581 r	18,073
Bromine[e]		2,000	2,000	3,500	3,500	3,500
Caustic soda		30,509	18,013	20,635	7,041 r	6,220
Cement		1,622,000	1,692,800 r	1,594,900	1,286,300 r	1,278,800
Gypsum		35,034	22,037	38,375	45,630	48,386
Iodine[e]	kilograms	300,000	300,000	300,000	300,000	300,000
Lime, construction		27,175 r	15,294	1,318 r	700 r	800
Limestone		1,416,039	1,413,031	1,363,978	1,228,775 r	1,173,863
Salt		12,029	7,127	7,527	5,462 r	4,400
Sand, construction		986,700	702,100	1,247,200	877,200 r	1,178,000
Sulfuric acid		19,700	24,800	39,400	12,400 r	10,100
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	6,820	10,832	16,337	16,325	16,673
Petroleum:						
Crude:						
In gravimetric units		33,049,128	43,336,197	44,720,275	48,302,800 r	48,436,500
In volumetric units[e]	42-gallon barrels	240,000,000	315,000,000	325,000,000	351,000,000	352,000,000
Refinery products:						
In gravimetric units		7,788,800	8,088,500	6,885,300	5,430,200 r	5,543,000
In volumetric units	42-gallon barrels	63,309,000	60,224,000	58,807,000	46,400,000 e	47,400,000 e

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through March 20, 2012.

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TABLE 2
AZERBAIJAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Locations or deposit names	Annual capacity[e]
Alumina	Gyandzha refinery	Ganca	450,000
Aluminum	OJSC Azerbaijan Aluminum [Azeraluminum (Azeral)] Sumgait smelter	Sumqayit	60,000
Alunite ore	Zaglik alunite mining directorate	Zaylik, Dashcasan region	600,000
Cement	Plants: Karadagly Tauz	Locations: Qaradagli Tavuzcay region	2,000,000 [2]
Clays, bentonite	Dash-Salakhlinskoye deposit	do.	100,000
Copper ore	Karadagskiy complex	Samkir region	30,000
Gold	Anglo Asian Mining PLC	Gedabek	NA
Iodine and bromine	Baku, Karadagly, and Novaneftechala plants	Plants in Baku, Qaradagli, and Neftcal	NA
Iron ore, marketable	Dashkasan mining directorate	Daskasan region	50,000
Natural gas, processing	Karadagly plant	Qaradagli region	NA
Petroleum and natural gas:			
Crude petroleum and gas condensate	Azerbaijan International Operating Co., (AIOC) in conjunction with BP p.l.c., Chevron Corp., State Oil Company of Azerbaijan Republic (SOCAR), Total S.A., Inpex Corp., Statoil ASA, Exxon Mobil Corp., Türkiye Petrolleri A.O. (TPAO), Itochu Corp., Devon Energy Corp., and Delta Hess (joint venture of Delta Oil and Hess Corp.)	Azeri-Chirag-Guneshli (ACG) offshore oilfields in the Caspian Sea	55,000,000
Natural gas billion cubic meters	International consortium consisting of BP p.l.c., Statoil ASA, OAO Lukoil, Oil Industries' Engineering and Construction (OIEC), State Oil Company of Azerbaijan Republic (SOCAR), Total S.A., and Türkiye Petrolleri A.O. (TPAO)	Shah-Deniz gas condensate field	7.1
Refined petroleum	Azernefteyag refinery	Baku	12,000,000 [3]
Do.	Heydar Aliev Baku refinery	do.	8,000,000 [3]
Rock salt	Hehram and Pusyan deposits	Naxcivan region	2,500,000
Steel:			
Crude	Baku Steel Works	Baku	400,000
Pipe, tubes	Azerboru JSC	Sumqayit	400,000

[e]Estimated. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce cement.

[3]Capacity for crude petroleum distillation.

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The Mineral Industry of Belarus

By Elena Safirova

Belarus' mineral production enterprises included two metalworks plants, a nitrogen production enterprise, two crude oil refineries, and a potash mining company. The country's only mineral production enterprise that played a major role in world markets was its potash mining firm OAO Belaruskali. Although Belarus does not have significant sources of fuel minerals on its territory, it had a number of energy infrastructure establishments (oil pipelines, gas pipelines, and two large oil refineries) that positioned the country as an important player in the export of oil and gas to Europe from Russia.

Minerals in the National Economy

In 2010, the industrial production of Belarus contributed 26.8% to the Republic's gross domestic product (GDP). The fuel sector accounted for 17.6% of the country's total industrial production; the chemical and petrochemical sector, 13.1%; the construction materials sector, 5.4%; and metallurgy, 4.0%. In 2010, the value of overall mineral industry output increased by 9.1% compared with that of 2009; the value of produced ferrous metals increased by 22.8%, and that of construction materials increased by 13.2% compared with that of 2009. At the same time, the output of the fuel sector decreased in value by 21.9%, and that of the chemical and petrochemical sector dropped by 15.9% (National Statistical Committee of the Republic of Belarus, 2011c, d). The decreases were largely owing to the dispute with Russia concerning the pricing of crude oil and gas delivered to Belarus that resulted in drastic reductions in Belarus' oil refinery output in the beginning of the year. Previously, the economy of Belarus was dependent on oil and natural gas imported from Russia. In 2010, however, Belarus was involved in gas and oil disputes with Russia and had to find new sources of crude petroleum for its refineries (Khodasevich, 2010).

Starting in 2010, Russia changed the oil pricing schemes for Belarus. The first 6.3 million metric tons (Mt) of oil delivered to Belarusian refineries was assumed to be used for domestic consumption in Belarus; consequently, this oil was not subject to Russian customs duties and was sold at the Russian internal price [about $300 per metric ton, or $41 per barrel in January 2010]. All delivered oil beyond this limit, however, was to be levied the same customs duty as the oil exported to Western Europe, which effectively raised the price to about $550 per metric ton, or $75 per barrel (Korzhubaev and others, 2011). In March 2010, the Government of Belarus signed a contract with the Government of Venezuela and started importing crude oil from South America. Although high transportation costs and the complex logistics made Venezuelan oil more cumbersome and expensive to import, Venezuelan oil was of the light "Santa Barbara" type of crude oil and could be refined more effectively than the Russian heavy type of crude oil (known as "Urals"). The transportation channels used for Venezuelan oil included tanker transportation to the Ports of Klaipeda (in Lithuania), Muuga (in Estonia), and Odessa (in Ukraine), and with further transportation by either rail or pipeline (the Odessa-Brody pipeline in reverse regime). In 2010, Belarus imported 1.8 Mt of crude oil from Venezuela whereas imports from Russia dwindled to 13 Mt from 21.5 Mt in 2009 (National Statistical Committee of the Republic of Belarus, 2011e; PO Khimmash, 2011).

Belarus also set up a contract with Azerbaijan to import "Azeri Light" crude oil. The transportation channel for this oil was by tanker to the Port of Yuzhnyi in Ukraine and then through the Druzhba and the Odessa-Brody pipelines to the Mozyr oil refinery in Belarus. Although the negotiations with the Azerbaijani side were completed in 2010, the first oil from Azerbaijan was not delivered to Belarus until 2011 (Deutsche-Welle, 2011).

In September 2010, Russia announced the elimination of the customs duty on the oil exported to Belarus but that the refinery products exported from Belarus and the crude oil reexported to other countries were to be levied Russian customs duties. The new customs duty regime was supposed to go into effect in January 2011 (Lenta.ru, 2010).

The gas pipeline that passed through Belarus was a significant export route for gas from Russia to Europe and was operated by OAO Beltransgaz. In 2007, the Russian natural gas monopoly OAO Gazprom agreed to purchase 50% of Beltransgaz stock for $2.5 billion, and the other 50% would continue to be owned by the Government of Belarus. Under the agreement, Belarusian domestic natural gas customers could purchase Russian gas at a discounted rate compared with the amount paid by consumers in the European Union (EU). For 2010, the gas price for Belarus was set at 90% of the natural gas price set for the EU. Beginning in 2011, however, Belarus would pay the same price for natural gas as other European countries ($230 per cubic meter), but would not be charged any export duties (BBC Russian.com, 2007; OAO Beltransgaz, 2011).

Production

In 2010, Belarus continued to recover from the recession, and production of most mineral commodities returned to prerecession levels. Production of potash increased by 110% to 5.2 Mt. Belarus increased production of all steel products: output of steel pipes increased by 70.6% to 183,200 metric tons (t); steel cord, by 34.8% to 92,900 t; crude steel, by 9.1% to 2.7 Mt; and rolled steel, by 6.9% to 2.5 Mt. Other minerals for which production increased included sulfuric acid, the output of which increased by 7.0% to 891,000 t; peat, by 4.2% to 2,593 t; and cement, by 4.1% to 4.5 Mt. The only mineral commodity for which output decreased sharply was refined petroleum—production of refined petroleum decreased by 24% to about 16.5 Mt (National Statistical Committee of the Republic of Belarus, 2011a, c, d).

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Structure of the Mineral Industry

Most of the mineral industry enterprises were united under the State Concern for Oil and Chemistry Belneftekhim. Belneftekhim included OAO Belaruskali, which was one of the leading potash producers in the world; OAO Grodno Azot, which specialized in the production of ammonia, nitrogenous fertilizers, and sulfuric acid; two oil refineries (OAO Naftan and OAO Mozyr NPZ), which had total annual throughput capacity of 22 Mt; and almost 50 other organizations. Belarus had adopted an industry privatization plan and created a list of enterprises that were subject to privatization in 2008 through 2010. The list included only smaller production facilities, however, and excluded all of the country's enterprises of national significance (Romanchuk, 2011).

In 2010, Belarus found itself in need of financial resources and was reconsidering its position on privatization of large companies. In July 2010, the Parliament voted to exclude the potash producer Belaruskali from the list of the enterprises that cannot be privatized. Other candidates for privatization and sale mentioned in the media were Grodno Azot and the oil refineries. Nevertheless, as of the end of 2010, no privatization deals had been made (RIA Novosti, 2011).

Commodity Review

Metals

Iron and Steel.—The Byelorussian Steel Works (BMZ) remained the predominant producer of iron and steel in Belarus. The BMZ's main plant, which was located in the city of Zhlobin, accounted for more than 90% of total national steel production. It consisted of four production divisions that engaged in steel melting, steel rolling, steel cord and wire production, and pipe rolling. The steel melting division included a scrap preparation shop and two electric melt shops. The rolling production unit consisted of a section rolling shop with three rolling mills that also produced steel cord and wire.

In 2010, the Zhlobin plant produced 2,530,949 t of raw steel, 2,098,711 t of rolled steel, 97,027 t of steel pipes, 92,883 t of steel cord, 37,177 t of hose wire, 29,937 t of bronze-plated bead wire, and 193,868 t of other steel wire. The composition of the company's products had been shifting towards an increase in the percentage of high-tech output, such as wire products and steel pipes. In addition to the Zhlobin plant, the BMZ Group included three other metallurgical enterprises: the Gomel Casting Plant; OAO Mogilev Metallurgical Works (MMZ), which specialized in the production of welded pipes; and the Rechitsa Metizny Plant (RMZ). Some of the most competitive products of BMZ included reinforcing bar and steel cord for tires. Steel cord produced by BMZ was used by all major tire manufacturers in the world; reportedly, 15% of world steel tire cord was produced at BMZ (Byelorussian Steel Works, 2011).

In 2010, BMZ exported its products to Africa, the Commonwealth of Independent States (CIS), Europe, and the Middle East. The company developed new steel markets, such as in Albania, the Democratic Republic of the Congo [Congo (Kinshasa)], Hong Kong, Mauritania, Switzerland, and Venezuela. In 2010, BMZ delivered to Europe and the CIS countries 750,839 t and 508,735 t of its products, respectively, whereas Africa and the Middle East received 562,038 t of Belarusian steel. The increase in exports to European countries was owing to increased demand at tire and rubber plants and an increase in demand for steel pipes by the European engineering industry. At the same time, the recovery of construction activity in the CIS countries led to increased demand for construction materials (fiber, reinforcing bar, and wire rods) (Byelorussian Steel Works, 2011; National Statistical Committee of the Republic of Belarus, 2011e).

Industrial Minerals

Cement.—Cement production in Belarus was conducted by three major cement plants. PRUP Krichevzementnoshifer in the Mogilev region was the leading cement producer; it had a capacity of 1.8 million metric tons per year (Mt/yr) and also manufactured asbestos cement boards. PRUP Belarusian Cement Plant (BCZ), which was also known as Kostyukovichi Cement Plant, was also located in the Mogilev region and produced cement, chalk, and lime. BCZ had won many awards for the quality of its products; it had a capacity to produce 1.1 Mt/yr of cement. OAO Krasnoselskstroymaterialy (also known as the Volkowysk Cement Plant) was located in the Grodno region. In addition to cement, it produced asbestos boards, chalk, concrete blocks, dry builders mixes, and lime, and had a production capacity of 900,000 t of cement (Nezavisimyi Stroitel'nyi Portal, 2011; PRUP Belarusian Cement Plant, 2011).

With a total national domestic consumption of about 4.5 Mt/yr, domestic cement producers could not meet domestic demand for cement. By the beginning of 2011, the domestic shortage reached 2 Mt/yr. Three new production lines (one new line for each of the three cement plants) were being constructed in cooperation with Chinese company CITIC Group, formerly known as the China International Trust and Investment Corp.; the combined cost of the project was $1.3 billion. The new production lines were planned to be completed in 2011, but as of March 2011, only about 30% of the construction had been done. Another new cement plant in the Gomel region was being built by Azarab Industries of Iran. When all new plants start production, the total capacity was expected to increase by 6 Mt/yr (21.BY, 2011; Bulatetskaya, 2011).

Nitrogen.—Grodno Azot was the leading producer of nitrogen-based fertilizers and liquid ammonia in Belarus. It specialized in the production of ammonium sulfate, biodiesel fuel, caprolactam, carbamide, carbamide-ammonium nitrate mixture (CAN), liquid ammonia, liquid carbon dioxide, and methanol. About 40% of the company's products was exported, and the rest was used to satisfy domestic demand. The trademark of Grodno Azot was registered in 18 countries (OAO Grodno Azot, 2011).

Grodno Azot adopted a program of modernization for 2010 through 2016 that was expected to increase its capacity by 40% at a cost between $1.3 billion and $1.5 billion. The main component of the modernization program was a new facility that would be able to produce all three main products—ammonium, carbamide, and methanol—and would provide greater flexibility

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in choosing the production mix, depending on market demand (National Statistical Committee of the Republic of Belarus, 2011b; OAO Grodno Azot, 2011).

As a highly energy-intensive enterprise, Grodno Azot had been affected by the recent natural gas conflicts with Russia. Although the Government of Belarus shielded producers "of republican scale," such as Grodno Azot, from the two hikes in natural gas prices during 2010, in the long run, the company's profits were likely to be eroded by rising energy prices.

Potash.—OAO Belaruskali was one of the world's leading producers of potash mineral fertilizers and had a 16% share of the world market. In 2010, the production of potash in Belarus had increased to its pre-recession production level of 5.2 Mt from about 2.5 Mt in 2009. Potash was the leading export product for Belarus, and potash exports were valued at more than $2.2 billion. About 80% of the company's output was exported to China, East Asia, Europe, India, the Mediterranean region, North America, South Africa, and South America; 97.3% of potash exports was directed to countries outside of the CIS. The leading importers of Belarusian potash were Brazil (27.9%), India (14.7%), and China (10.2%) (Jasinski, 2011; OAO Belaruskali, 2011).

The Starobin potash deposit that Belaruskali mined contains magnesium salt, rock salt, and sylvinite. Commercial levels of potash occur at depths of 400 to 1,200 meters (m) and deeper. The thickness of individual beds of potash varies from 4 to 20 m. Potash salts are located inside layers of rock salt. The Belaruskali development program for the period 2006 through 2012 included development of the Krasnoslobodskiy Mine. The first production line of the Krasnoslobodskiy Mine was constructed in 2009, and the second and third lines were under construction in 2010. Other mines in early stages of exploration were the Beryozovskiy section of the deposit and the Darasinsky Mine. Belaruskali expected to increase its production capacity to 11 Mt/yr by 2015 (OAO Belaruskali, 2011).

In 2010, the president of Belarus signed a decree about the conversion of Belaruskali into a joint stock company. Prior to 2010, the enterprises that produced potash fertilizers were, by law, exclusively owned by the Government. In 2010, multiple rumors about probable buyers of Belaruskali as well as the market price of the company, were circulated in the press, but the sale did not take place. By different estimates, Belaruskali was worth between $15 and $30 billion (RIA Novosti, 2011).

Mineral Fuels

Peat.—In Belarus, peat was produced by a large number of small plants located throughout the country. Recent difficulties related to access to Russian natural gas and petroleum had made using peat as a fuel more attractive. In 2008, Belarus adopted a new Government program that was intended to increase peat production for the period of 2008 through 2020. According to this program, peat extraction was expected to increase to 4.4 Mt/yr by 2020 compared with production in 2010 of 2.4 Mt (Sovyet Ministrov Respubliki Belarus, 2008). The goal of the program was to increase the percentage of local and alternative energy sources to 25%. The peat program met significant resistance from the environmental community of Belarus, however. The main concern was that increased peat extraction is likely to destroy famous Belorussian marshes and their ecosystems and lead to increased peat fires while making renewable types of energy, such as biomass, less attractive (Zelenaya Belarus, 2011). As a result, it was unclear whether the peat program would continue as planned in the future.

Petroleum.—Petroleum reserves in Belarus are limited and provide only a small fraction of the crude petroleum supply for the country's refineries. Moreover, the Government limits annual extraction of several mineral resources, such as petroleum, salt, and sand. As a result, annual petroleum extraction was 1.70 Mt in 2010 compared with 1.72 Mt in 2009. The limit for 2011 was set at 1.68 Mt (Novosti@Mail.ru, 2011).

The output of refined oil in 2010 dropped to about 16.5 Mt from 21.6 Mt in 2009. The reason was the continuing conflict with Russia concerning the price of the Russian crude oil. Nevertheless, sales of refined petroleum contributed $6.7 billion to the country's export revenue (or 26.85% of the total revenue). The importers of Belarusian gasoline and other refinery products in 2010 included the Netherlands (43.3%), Ukraine (19.5%), the United Kingdom (14.1%), and Latvia (8.0%) (National Statistical Committee of the Republic of Belarus, 2011e; OAO Mozyr NPZ, 2011; OAO Naftan, 2011).

Outlook

Belarus is expected to continue to be a major supplier of potash to the world markets and to develop additional mines in the Starobin deposit. The future of other sectors of the mineral industry, especially mineral fuels, is highly uncertain. It is expected that in the years to come Belarus may privatize and sell some of its flagship enterprises, such as Belaruskali, Grodno Azot, OAO Mozyr NPZ, and OAO Naftan. If some of those facilities change owners, the direction of enterprise development may be affected. Finally, it is unclear how Belarus will continue to address the issues of its energy dependence on Russia. Although by the end of 2010 the country had reached a new agreement with Russia about oil prices, it also developed new crude oil sources for its refineries, such as Azerbaijan, Kazakhstan, and Venezuela. The future direction of Belarus' energy sector is likely to depend on political relations with Russia and on the country's ability to develop and maintain a reliable business network with countries outside of the CIS community.

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TABLE 1

BELARUS: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Steel:						
Crude		2,297	2,387	2,660	2,449	2,672
Rolled		2,047	2,192	2,387	2,299	2,458
Pipes	metric tons	134,200	147,900	145,000	107,400 r	183,200
Steel cord	do.	86,400	87,200	96,500	68,900	92,900
INDUSTRIAL MINERALS						
Cement		3,495	3,820	4,219	4,350	4,531
Diamond, synthetic[e]	thousand carats	25,000	25,000	25,000	25,000	25,000
Lime		853	925	900 r	787 r	805
Nitrogen, N content of ammonia	metric tons	815,000	834,000 r	743,400 r	828,600 r	835,900
Potash, K_2O equivalent		4,605	4,972	4,968	2,485	5,223
Salt[2]	metric tons	2,075,693	1,665,350	1,476,000	1,695,100	1,700,000 e
Sulfuric acid		756	788	857	833	891 e
MINERAL FUELS AND RELATED MATERIALS						
Natural gas	million cubic meters	219	201	203	205	213
Peat:						
Horticultural use		300	318	395	272	241
Fuel use		2,500	2,502	2,361	2,216 r	2,352
Total		2,800	2,820	2,756	2,488 r	2,593
Petroleum:						
Crude		1,780	1,760	1,740	1,720	1,700
Refined		21,253	21,349	21,305	21,634	16,455

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto.

[1]Table includes data available through December 14, 2011.

[2]Includes byproduct salt from potash production.

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TABLE 2
BELARUS: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Cement	OAO Krasnoselskstroymaterialy	Hrodzyenskaya Voblasts'	900,000
Do.	PRUP Krichevzementnoshifer	Mahylyowskaya Voblasts'	1,800,000
Do.	PRUP Belarusian Cement Plant (BCZ)	do.	1,100,000
Diamond	Gomel Production Association Kristall	Homyel'skaya Voblasts'	NA
Nitrogen	OAO Grodno Azot (Belneftekhim)	Hrodzyenskaya Voblasts'	950,000 [1]
Peat, fuel use	Production at 31 enterprises that produce mainly briquets	All regions of the country	5,000,000 [2]
Petroleum:			
Crude	NGDU Rechitsaneft (Belneftekhim)	Rechitskoye, Ostashkovichskoye, Vishanskoye, Tishkovskoye, and Yuzhno-Ostashkovichskoye deposits, southeastern part of the country	2,000,000
Refined	OAO Mozyr NPZ (Government of Belarus, 42.7%, and Slavneft, 42.5%)	Homyel'skaya Voblasts'	10,000,000 [3]
Do.	OAO Naftan (Novopolotsk NPZ)	Vitsyebskaya Voblasts'	12,000,000 [3]
Potash	OAO Belaruskali (Belneftekhim)	Starobin deposit, Minskaya Voblasts'	5,500,000 [4]
Steel:			
Crude	Byelorussian Steel Works (BMZ) (Ministry of Industry)	Zhlobin, Homyel'skaya Voblasts'	2,600,000
Pipe	do.	do.	100,000
Rolled	do.	do.	2,300,000
Do.	OAO Mogilev Metallurgical Works [Byelorussian Steel Works (BMZ)]	Mahylyowskaya Voblasts'	120,000

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]N content of ammonia.

[2]Total peat for fuel use.

[3]Crude throughput.

[4]K_2O equivalent.

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The Mineral Industries of Belgium and Luxembourg

By Alberto Alexander Perez

BELGIUM

Belgium is a participant in the Benelux customs unit, along with Luxembourg and the Netherlands. The Benelux customs unit is an economic union aimed at reinforcing cross-border cooperation between the three countries.

Belgium's industry depended greatly on nondomestic markets, especially those of other European Union (EU) countries. Its main trading partners as of 2009 (the latest year for which data were available) were, in order of value, Germany, which accounted for 19.6% of Belgium's exports and 17.1% of its imports; France, 17.7% of exports and 11.7% of imports; the Netherlands, 11.8% of exports and 17.9% of imports; the United Kingdom, 7.2% of exports and 5.1% of imports; Ireland, 6.3% of imports; the United States, 5.4% of exports and 5.7% of imports; China, 5.4% of imports; and Italy, 4.7% of exports (U.S. Central Intelligence Agency, 2011).

In 2010, Belgium's gross domestic product (GDP) based on purchasing power parity was $394 billion. Belgium's real GDP increased by 2.1% compared with that of 2009.

Minerals in the National Economy

Trading of diamond and the processing of metals were the leading mineral industries in Belgium. The country had no economically exploitable reserves of coal or metallic ores in 2010.

The country imported substantial quantities of raw materials. The metal processing industries were significant to the Belgian economy, in particular, steel. Belgium had been the 18th ranked steel producer in the world in 2008, measured by volume of production, but owing to the worldwide decrease in the demand for steel, it was ranked 23d in 2009 (the latest year for which data were available). Belgium produced 8.09 million metric tons (Mt) of steel in 2010 compared with 5.6 Mt in 2009 (World Steel Association, 2010, p. 9; 2011).

Umicore Group, which was one of Europe's leading metal recyclers and processors, was headquartered in Hoboken, Belgium. Umicore comprised of a catalysis division, an energy materials division, a performance materials division, and a recycling division (N.V. Umicore S.A., 2011).

Nyrstar NV was the leading producer of zinc, by volume, in the world. Nyrstar was headquartered in Balen, Belgium, where it also operated the Balen/Overpelt smelter and zinc alloy facility. Nyrstar also owned smelters in Auby, France; Budel, Netherlands; Clarksville, Tennessee; and Hobart and Port Pirie, Australia (Nyrstar NV, 2011, p. 4).

According to the Antwerp World Diamond Centre, Antwerp was the center of the world's open rough diamond market; that is, nearly all the uncut stones that were not handled through the DeBeers Group's Diamond Trading Co. (DTC) passed through Antwerp. Antwerp was also home to the largest concentration of the De Beers Group's clients, and as such, it also served as a center of operations for the rough diamond sourced through the DTC. The most valuable stones in the diamond trade were cut mainly in Antwerp; however, most manufacturing was performed in several other countries. Rough diamonds were sorted and planned in Antwerp, then dispatched from Antwerp to cutting plants across the globe; later, these diamonds would return to the city as polished diamonds to be sold in the jewelry markets. Of Antwerp's four diamond exchanges, three served primarily the polished diamond trade (Antwerp World Diamond Centre, 2010).

Production

Owing to the recovery of the world steel industry and the increase in the demand for steel, Belgian production of crude steel and pig iron increased in 2010. Crude steel production increased by 43.5%, and pig iron production increased by 53%. Mining was less important to the country's economy in recent years than in the past, and in 2010, mining was conducted only for industrial minerals. The refining of copper, minor metals, and zinc and the production of steel were the leading mineral industries in Belgium. The country was also a producer of cadmium, cobalt, germanium, selenium, tin, and tellurium. Belgium's well-developed industrial minerals sector included the production of such industrial and construction materials as cement, dolomite, limestone, and silica sand (table 1).

Structure of the Mineral Industry

The principal mining and mineral processing facilities in Belgium, with their locations and capacities, are listed in table 2. Most facilities were privately owned either by Belgian companies or other EU companies.

Commodity Review

Metals

Iron and Steel.—In December 2010, ArcelorMittal spun off its stainless steel division and created Asperam S.A. The new company combined all the stainless steel operations of ArcelorMittal in the world, including the Chatelet and the Genk electric arc furnace plants where flat stainless steel was produced (ArcelorMittal, 2010).

In 2010, the production of pig iron and crude steel in Belgium increased by 43.5% and 53%, respectively. The production increase was most likely owing to the increase in world demand (table 1).

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Zinc.—Nyrstar reported that the Balen smelter had been brought back to full production in the first quarter of 2010, and that the company expected record production by year's end. The smelter had been on care-and-maintenance status from December 2008 to September 2009 owing to the decreased demand for zinc worldwide (Nyrstar NV, 2011, p. 14).

Industrial Minerals

Diamond, Industrial.—In 2010, Belgium's polished and rough diamond trade ended the year with a turnover of $41.9 billion compared with $30.3 billion in 2009. The exports of polished diamond increased by 7.1% in 2010 by volume to 7.79 million carats; the increase in the value of polished diamond was much higher compared with that of 2009, increasing by 28.6% to $11.1 billion (Antwerp World Diamond Centre, 2011).

Mineral Fuels

Natural Gas and Petroleum.—Vitol Tank Terminals B.V. (VTTI) through its subsidiary Eurotank Belgium B.V. [which was part of the Vitol Group (Vitol)], announced that it had completed the acquisition of 100% interest in Petroplus Refining Antwerp N.V. and Petroplus Refining Antwerp Bitumen N.V., which had previously been owned by Universal Holding B.V. and Petroplus International B.V. Under the terms of the acquisition, Vitol would change the names of the facilities to Antwerp Terminal Company N.V and Antwerp Processing Company N.V., respectively. The facilities would be jointly known as the Antwerp Terminal and Processing Co. (ATPC) (Vitol Tank Terminals B.V., 2011).

Outlook

Belgium is expected to remain a significant mineral processor and major diamond trader. Its steel production is expected to continue to increase as demand increases and the automobile market is reactivated. Belgium is also expected to remain significant in international and intra-European cargo handling of mineral products through its major ports (Antwerp, Ghent, Ostend, and Zeebrugge). The importance that Belgium has been giving to renewable energies is expected to continue.

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LUXEMBOURG

In 2010, the iron and steel industry was Luxembourg's most economically important mineral industry sector, and steel was the country's main export commodity. Because it is a member of the Belgium Luxembourg Economic Union (BLEU), trade statistics for Luxembourg are inextricably linked with those of Belgium and, therefore, cannot be listed individually. International trade data for Belgium and Luxembourg are given in the Belgium section of this chapter.

Production

Mining in Luxembourg consisted of small industrial mineral operations that produced material only for domestic consumption. These minerals included dolomite, limestone, sand and gravel, and slate. Information on these operations was not readily available. Some commodity production data are in table 1.

Structure of the Mineral Industry

The principal mineral facilities in Luxembourg with their locations and capacities are listed in table 2. Most facilities were privately owned.

Commodity Review

Metals

Iron and Steel.—ArcelorMittal which was headquartered in Luxembourg, was the world's leading steel manufacturer in the world. It was two times larger, in terms of volume, than its nearest rival, BaoSteel Group Corp. Ltd. of China (World Steel Association, 2010, p. 8).

ArcelorMittal spun off its worldwide stainless steel operations and created a separate company called Asperam S.A. The company was registered and based in Luxembourg (ArcelorMittal, 2010).

Luxembourg's crude steel production increased by 15.7% in 2010 compared with production in 2009, reaching the production levels of 2008. Its production of hot-rolled steel decreased by 33.2% (table 1).

Aciéries Réunies de Burbach-Eich-Dudelange (ARBED), which was a subsidiary of ArcelorMittal, dominated Luxembourg's mineral industry. ARBED was the major producer of crude steel, pig iron, and stainless steel, all of which

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were produced from imported material. The company produced large structural beams and specialized value-added products (ArcelorMittal, 2009).

Outlook

Luxembourg is expected to continue to be a producer and exporter of steel. The country's industrial mineral production will likely be limited to domestic consumption.

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TABLE 1

BELGIUM AND LUXEMBOURG: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2006	2007	2008	2009[e]	2010[e]
BELGIUM[2]						
Metals:						
Aluminum, secondary including unspecified metals[e]		125	125	125	100	100
Bismuth, metal[e]		500	500	500	500	500
Cobalt, primary[3]		2,840	2,825	3,020	2,150 r	2,600
Copper:						
Smelter, secondary		114,600	115,200	115,900 r	117,400 r,4	117,000
Refined, primary and secondary		382,600	394,400	395,800	373,700 r,4	370,000
Iron and steel:						
Pig iron	thousand metric tons	7,516	6,576	7,125	3,087 4	4,725 4
Steel:						
Crude	do.	11,238	10,692	10,676 r	5,635 4	8,088 4
Hot-rolled products	do.	12,761	11,450	11,792	6,000	6,000
Lead, refined, secondary		62,330	63,454	80,966	109,000 r	105,000
Selenium[e]		200	200	200	200	200
Tin, metal, secondary including alloys		8,000 r	8,400	9,200	8,700 r,4	8,700
Zinc:						
Slab:						
Primary		219,800	241,300	239,000 e	14,000 r	280,000
Secondary, possibly remelted zinc[e]		40,000 4	40,000	40,000	40,000	40,000
Total		259,800	281,300	279,000 e	54,000 r	320,000
Powder[e]		20,000	20,000	20,000	20,000	20,000
Industrial minerals:						
Barite[e]		28	28	28	28	28
Cement	thousand metric tons	8,192	9,571	9,700 r,e	8,500 r	8,300
Clay, kaolin[e]	do.	460	460	460	460	460
Lime and dead-burned dolomite, quicklime[e]	do.	2,400	2,400	2,400	2,400	2,400
Nitrogen, N content of ammonia	do.	825	830	830 e	830	830
Sodium sulfate[e]	do.	250	250	250	250	250
Stone:[e]						
Worked		18,798 4	19,000	19,000	19,000	19,000
Natural (excluding slate)		336,584 4	340,000	340,000	340,000	340,000
Sulfur:[e]						
Byproducts:						
Elemental		225,000	225,000	225,000	225,000	225,000
Other forms		175,000	175,000	175,000	175,000	175,000
Total		400,000	400,000	400,000	400,000	400,000
Sulfuric acid	thousand metric tons	1,393 4	1,400	1,400	1,400	1,400

See footnotes at end of table.

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TABLE 1—Continued

BELGIUM AND LUXEMBOURG: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Country and commodity		2006	2007	2008	2009[e]	2010[e]
BELGIUM—Continued[2]						
Mineral fuels and related materials:						
Carbon black[e]	thousand metric tons	1,000	1,000	1,000	1,000	1,000
Coke, all types	do.	2,895	2,607	2,309	2,300	2,300
Gas, manufactured	thousand cubic meters	425,504	463,659	463,000 [e]	463,000	463,000
Petroleum refinery products:[5]						
Liquefied petroleum gas	thousand 42-gallon barrels	4,746	5,370	5,946	5,289 [r, 4]	5,200
Naphtha and white spirit	do.	11,158	14,356	14,300 [e]	14,300	14,300
Gasoline	do.	53,570	42,664	34,257	32,338 [r, 4]	32,000
Kerosene	do.	13,512	13,806	14,758	16,294 [r, 4]	16,000
Kerosene, other	do.	340	261	283	466 [r, 4]	460
Distillate fuel oil	do.	94,443	95,815	96,425	88,289 [r, 4]	88,000
Refinery gas	do.	3,864	3,874	3,800 [e]	3,800	3,800
Residual fuel oil	do.	47,472	49,227	43,701	34,432 [r, 4]	34,000
Bitumen	do.	8,520	8,635	8,600 [e]	8,600	8,600
Total	do.	237,625	234,008	222,070	203,808 [r, 4]	202,000
LUXEMBOURG						
Metals, steel:						
Crude	thousand metric tons	2,802	2,858	2,582	2,215 [4]	2,563 [4]
Hot-rolled products	do.	3,176	3,214	2,837	2,910 [r, 4]	1,941 [4]
Industrial minerals:						
Cement, hydraulic[e]		901,000 [r, 4]	1,081,000 [r, 4]	1,091,000 [r, 4]	1,000,000 [r, 4]	1,078,000 [4]
Phosphates, Thomas slag:[e]						
Gross weight		475,000	475,000	475,000	475,000	475,000
P_2O_5 content		70,000	70,000	70,000	70,000	70,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto.

[1]Table includes data available through June 1, 2011.

[2]In addition to the commodities listed, Belgium produced a number of other metals and alloys, for which only aggregate output figures were available.

[3]Production reported by N.V. Umicore S.A. includes production from China and South Africa.

[4]Reported figure.

[5]Conversion factors from metric tons to 42-gallon barrels for petroleum refinery products are as follows: liquefied petroleum gas—11.6; naphtha and white spirit—8.5; gasoline—10; kerosene—7.75; distillate fuel oil—7.46; refinery gas—8.04; residual fuel oil—6.66; and bitumen—6.06.

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TABLE 2
BELGIUM AND LUXEMBOURG: STRUCTURE OF THE MINERAL INDUSTRIES IN 2010

(Thousand metric tons unless otherwise specified)

Country and commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
BELGIUM				
Cadmium, metal	metric tons	N.V. Umicore S.A.	Hoboken	1,800
Cement		Major companies:	Plants:	8,400
Do.		Cimenteries CBR SA (Heidelberg Cement Group)	Major plants at Lixhe, Mons/Obourg, Harmignies, Marchienne, and Ghent	(3,200)
Do.		Ciments d'Obourg SA (Holcim Group)	Plants at Obourg and Thieu	(2,800) [1]
Do.		Compagnie des Ciment Belge (Ciments Francais S.A.)	Plant at Gaurain-Ramecroix	(2,400)
Cobalt	metric tons	N.V. Umicore S.A.	Refinery at Olen	500
Copper		Metallo-Chimique NV (Metallum Group)	Smelter at Beerse	80
Dolomite		SA Dolomeuse (Group Lhoist)	Quarry at Marche les Dames	500
Do.		do.	Plant at Marche les Dames	750
Do.		SA de Marche-les-Dames (Group Lhoist)	Quarries at Nameche	3,000
Do.		do.	Plant at Nameche	3,000
Do.		SA Dolomies de Merlemont (Group Lhoist)	Quarry at Philippeville	100
Lead, metal		N.V. Umicore S.A.	Smelter at Antwerp-Hoboken	90
Do.		do.	Refinery at Antwerp-Hoboken	125
Do.		Nyrstar N.V.[2]	Smelter at Balen/Overpek	450
Limestone		Carmeuse S.A. (Long View Investment NV)	Mines and plant at Engis	1,850
Do.		do.	Mines and plant at Frasnes	450
Do.		do.	Mines and plant at Maizeret	850
Do.		do.	Mines and plant at Moha	800
Do.		SA Transcar (Royal Volker Stevin)	Mines and plant at Maizeret	850
Petroleum, refined	42-gallon berrels per day	Companies:	Refineries, of which:	
		Total S.A.	Refinery at Antwerp	268,000
Do.	do.	Esso S.A.NV	do.	239,000
Do.	do.	Antwerp Processing Co. (Vitol Group)	do.	125,000
Do.	do.	Belgian Refining Corp. (Petroplus AG)	do.	107,500
Do.	do.	PRA NV (Vitol Group)	do.	22,300
Salt		Zoutman NV	Plant at Roeselare	200
Sand, silica		SRC-Sibelco SA	Mines and plants at Lommel, Mol, and Maasmechelen	500
Steel		Various companies:	Which include:	14,000
Do.		ArcelorMittal Liege (ArcelorMittal)	Plant at Liege	3,000
Do.		Carsid S.A. (Duferco SIF S.A. NV)	Plant at Charleroi	2,000
Do.		ArcelorMittal Gent (ArcelorMittal)	Plant at Ghent	3,000
Do.		Duferco La Louviere S.A. (Duferco SIF S.A. NV)	Plant at La Louviere	2,400
Do.		Duferco Clabecq S.A. (Duferco SIF S.A. NV)	Plant at Clabecq	750
Do.		Industeel Belgium S.A. (ArcelorMittal)	Plant at Charleroi	600
Do.		ArcelorMittal Genk (ArcelorMittal)	Plant at Genk-Zuid	360
Do.		Tubemeuse Industries S.A. (Umran Steel Pipe Inc.)	Plant at Flemalle	50
Tin		Metallo-Chimique NV (Metallum Group).	Smelter at Beerse	500
Zinc, metal		Nyrstar N.V.	Smelter and refinery at Balen/Overpek	450
LUXEMBOURG				
Cement		Cimalux S.A. (Dyckerhoff AG).	Plant at Esch-sur-Alzette	850
Do.		Cimalux Intermoselle SARL (Dyckerhoff AG)	Plant at Rumelange	1,000
Steel		Acieries Reunies de Burbach-Eich-Dudelang (ArcelorMittal)	Plants at Differdange, Dudelange, Esch-Belval, Esch-Schifflange	5,320
Do.		Arcelor Differdange SA (ArcelorMittal)	Plant at Differdange	1,200
Do.		Ugine & ALZ Carnox (ArcelorMittal)	do.	1,000

Do., do. Ditto.

[1] Includes the capacity of the company SA Ciments de Haccourt.

[2] Company publicly traded with the following participation: Blackrock Group, 10.31%; Glencore International plc., 7.79%; and N.V. Umicore S.A., 5.25%.

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The Mineral Industry of Bosnia and Herzegovina

By Mark Brininstool

Bosnia and Herzegovina was not a major world or regional producer of minerals or mineral products. The gross domestic product (GDP) of Bosnia and Herzegovina increased in real terms by 0.7% compared with the GDP in 2009. The mineral industry contributed only a relatively small amount of value to the GDP. The value of mining and quarrying output made up only 2% of the GDP; the manufacture of basic metals (unfabricated metal products), 0.9%; and the manufacture of coke and refined petroleum products, 0.1%. Although they made up a small percentage of the GDP, metals were important in terms of trade. Basic metals made up about 19% of the value of exports and were the single largest export item in terms of value. Fabricated metal products (except machinery and equipment) made up another 6% of the value of exports (Agency for Statistics of Bosnia and Herzegovina, 2011a, p. 25–27; 2011b, p. 3, 5).

Production

In 2010, the production tonnage of most metals increased significantly as the mineral industry recovered from the low levels of production in 2009. Production of ferrosilicon increased by an estimated 85%; zinc content of ores and concentrate, by 62%; silicon metal, by 57%; lead content of ores and concentrate, by 52%; bauxite, by 49%; alumina, by 40%; pig iron, by 29%; and primary aluminum, by 23%. Production of iron content of iron ore decreased by 13%. For industrial minerals, production of dolomite increased by 153%; barite, by 90%; construction sand, by 66%; sodium bicarbonate, by 64%; porphyry, basalt, and other stones, by 44%; and lime by 21%. Production of bentonite decreased by 98%; slate, by 85%; kaolin, by 72%; graphite, by 66%; marble and travertine, by 58%; gypsum and anhydrite, by 13%; and cement, by 12%. For mineral fuels, production of coke increased by 51% (table 1).

All production figures for ferroalloys (ferrosilicon) were revised downward significantly and production figures for silicon metal were added to table 1. The production figures for ferroalloys that appeared in previous editions of the Minerals Yearbook had been reported by both the Federation of Bosnia and Herzegovina Federal Office of Statistics and by the Agency for Statistics of Bosnia and Herzegovina; however, the United Nations Commodity Trade Statistics database showed levels of ferrosilicon exports from Bosnia and Herzegovina to be quite small whereas exports of silicon metal are much closer to the reported figures for ferroalloys production. Based on this information, it is now believed that reported production of ferroalloys was actually a combination of the production of ferrosilicon and silicon metal, of which silicon metal made up the majority of the production. In table 1, production figures for ferroalloys have been revised and estimated based on export data. Production of nitrogen content of ammonia was revised to show no production because no ammonia production facilities in Bosnia and Herzegovina were known to exist.

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities.

Outlook

Bosnia and Herzegovina's mineral industry will most likely continue to be a relatively small producer of minerals and mineral products. Metals are expected to remain important export products for the country.

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TABLE I

BOSNIA AND HERZEGOVINA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]	2006	2007	2008	2009	2010
METALS					
Alumina	393,580	303,799	294,455	191,792	269,414
Aluminum:					
Primary	121,000	121,750	123,000	96,000	118,000
Unwrought aluminum, including alloys	136,190	147,193	155,903	130,042	150,488
Bauxite	854,047	866,933	1,018,333	555,820	827,909
Iron and steel:					
Ore and concentrate:					
Gross weight	1,888,091	1,613,963	1,481,730	1,614,890	1,401,000
Fe content[e]	793,000	678,000	622,000	678,000	588,000
Metal:					
Ferroalloys, ferrosilicon[e]	1,300 r	860 r	640 r	470 r	870
Pig iron	-- e	-- e	243,000	482,469	620,935
Crude steel	490,000	533,000	608,000	519,000	593,000
Lead:					
Ores and concentrate, gross weight	1,152	4,677	6,029	3,781	5,811
Pb content[e]	600	2,600	3,300	2,100	3,200
Metal, smelter, secondary	33	1	46	35	35 e
Silicon, metal[e]	15,200	11,600	12,400	11,000	17,300
Zinc:					
Ores and concentrate, gross weight	902	4,799	8,595	6,228	10,025
Zn content[e]	500	2,600	4,700	3,400	5,500
INDUSTRIAL MINERALS					
Barite	190	37	54	30	57
Cement	1,226,319	1,283,357	1,406,373	1,073,762	948,513
Clays:					
Bentonite	24,645	32,912	30,504	16,042	314
Ceramic clay, crude[e]	15,000	15,000	15,000	15,000	15,000
Kaolin, crude	69,643	188,033	259,325	148,384	41,808
Dolomite, crude	109,693	154,518	134,991	79,104 r	199,757
Graphite	387,838	393,762	272,084	133,819	45,079
Gypsum and anhydrite	131,936	154,294	150,039	74,302	64,570
Lime	218,121	237,190	215,787	280,939	339,429
Nitrogen, N content of ammonia[e]	-- r	-- r	-- r	-- r	--
Salt, all sources	416,305	502,487	555,122	556,089	662,631
Sand and gravel:					
Gravel	1,593,553	1,790,913	1,475,433	938,253	969,104
Sand, construction	20,835	98,267	175,527	156,128	258,886
Silica sand	711,399	671,336	702,018	524,752 r	494,568
Sodium compounds:					
Caustic soda[e]	12,156 [3]	-- r	-- r	-- r	--
Sodium bicarbonate	9,288	13,287	19,441	21,944	35,986
Stone:					
Dimension:					
Marble and travertine	2,664	6,049	5,785	6,358	2,674
Ecaussine and other calcareous stone	145,666	96,943	181,493	64,186	66,133
Granite	20,741	24,512	23,764	18,755	--
Porphyry, basalt and other stone	12,196	188,822	188,410	95,498	137,372
Slate	5,735	2,572	2,181	3,561	525
Crushed	3,035,727	2,901,891	4,370,598	3,577,927 r	3,438,028
Limestone, crushed and powdered	1,724,879	1,639,430	2,403,270	1,829,989	1,817,450

See footnotes at end of table.

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TABLE I—Continued

BOSNIA AND HERZEGOVINA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
MINERAL FUELS AND RELATED MATERIALS						
Brown coal and lignite	thousand metric tons	9,965	9,765	11,244	11,515	10,976
Coke		468,443	592,471	576,785	609,377	919,962
Petroleum refinery products[e, 4]	42-gallon barrels	86,400	91,000	853,000	8,240,000	8,920,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through September 8, 2011.

[2]In addition to commodities listed, calcined gypsum, common clay, magnesite, manganese ore, soda ash, and steel semimanufactures may have been produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Data were converted to barrels from metric tons, and were reported as follows: 2006—10,797; 2007—11,379; 2008—106,568; 2009—1,029,585; and 2010—1,114,669.

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TABLE 2
BOSNIA AND HERZEGOVINA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons)

Commodity	Major operating companies and major	Location of main facilities	Annual capacity
Alumina	Alumina Factory Birac a.d. (Ukio Banco Investment Group)	Plant at Zvornik	600
Aluminum	Aluminij d.d. Mostar	Smelter at Mostar	135
Bauxite	A.D. Boksit Milici	Mine at Milici, west of Srebrenica	NA
Do.	Rudnici Boksita Jajce d.d.	Mine at Jajce	NA
Cement	Tvornica Cementa Kakanj d.d. (Heidelberg)	Plant at Kakanj	750 e
Do.	Fabrika Cementa Lukavac, d.o.o.	Plant in Lukavac	800
Coal:			
Brown	RMU Banovici	Opencast mines Cubric, Grivice, and Turija; and underground mines Omazici and Separacija at Banovici	NA
Do.	Zenica Group	Stara Jama, Raspotocje, and Stranjani Mines at Zenica	NA
Do.	Durdevik Group	Potocari and Visca II opencast mines and Durdevik underground mine south of Zivinice	NA
Do.	Kakanj Group	Vrtliste opencast mine at Kakanj	NA
Do.	do.	Haljinic underground mine about 5 kilometers southeast of Kakanj	NA
Do.	Breza Group	Sretno and Kamenice underground mines 20 kilometers northwest of Sarajevo	NA
Do.	Abid Lolic Group	Grahovcici underground mine 10 kilometers west of Zenica	NA
Do.	Tusnica Mine	Drage opencast mine at Livno	NA
Do.	Rudnik i Termoelektrana Ugljevik (Elektrokrajina a.d.)	Opencast mine at Ugljevik	NA
Lignite	Kreka Group	Opencast mine at Dubrave	NA
Do.	do.	Opencast mine at Sikulje	NA
Do.	do.	Underground mines at Mramor, about 5 kilometers northeast of Lukavac, and Bukinje, located between Tuzla and Lukavac	NA
Do.	EFT Rudnik i Termoelektrana Stanari d.o.o. (EFT Group)	Stanari opencast mine 20 kilometers west of Doboj	NA
Do.	Rudnik I Termoelektrana Gacko (Elektrokrajina a.d.)	Opencast mine at Gacko	NA
Do.	Gracanica Group	Dimnjace opencast mine at Gornji Vakuf-Uskoplje	NA
Do.	Tusnica Mine	Opencast mine at Livno	NA
Coke	Global Ispat Koksa Industrija d.o.o.	Lukavac	700
Do.	ArcelorMittal Zenica (ArcelorMittal, S.A.)	Plant at Zenica	680 e
Ferroalloys, ferrosilicon	Elektrobosna, Elektrohemijska i Eletrotermijska Industrija	Plant at Jajce	NA
Do.	B.S.I. d.o.o. (Metalleghe S.p.a.)	do.	15
Iron ore	ArcelorMittal Prijedor (ArcelorMittal S.A., 51%)	Jezero and Buvac open pit mines at Ljubija	NA
Lead-zinc ore	NA	Mine and mill at Srebrenica	NA
Manganese ore	Rudnik Mangana Buzim (LM IMPEX)	Mine and concentrator at Buzim	NA
Petroleum, refined	Bosanski Brod refinery (JSC Zarubezhneft)	Oil refinery at Bosanski Brod	1,200
Do.	do.	Oil refinery at Modrica	NA
Pig iron	ArcelorMittal Zenica (ArcelorMittal, S.A.)	Blast furnace at Zenica	NA
Salt	Rudnik Soli Tusanj d.d.	Tuzla	NA
Steel, crude	ArcelorMittal Zenica (ArcelorMittal, S.A.)	Plant at Zenica	1,000
Steel, crude, secondary	Jelsingrad Livar Steel Foundry a.d.	Banja Luka	NA

eEstimated. Do., do. Ditto. NA Not available.

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The Mineral Industry of Bulgaria

By Alberto Alexander Perez

Bulgaria's mineral industry included mine output of metal ores, mineral fuels (mainly coal), and a variety of industrial minerals. Additionally, the metallurgical sector smelted and refined copper, lead, silver, steel, and zinc. On a world scale, however, Bulgaria's mineral industry was small and mainly of regional importance. Bulgaria had the potential to become a globally significant natural gas transit country because the planned Nabucco and South Stream pipelines were to pass through the country.

Minerals in the National Economy

In 2010, Bulgaria's gross domestic product (GDP) based on purchasing power parity was $99.04 billion, which was a slight increase compared with the country's GDP in 2009 of $98.84 billion. Bulgaria's industrial sector accounted for 30.7% of the GDP, and in 2010, the sector grew by 0.4% compared with that of the previous year. In 2009 (the latest year for which data were available), the production value of mining and quarrying activities decreased by 19% compared with that of 2008, and a reported 26,586 people were employed in mining and quarrying (National Statistical Institute of the Republic of Bulgaria, 2010a, b, 2011; U.S. Central Intelligence Agency, 2011).

Production

Refined copper production increased by 9% compared with that of 2009, and refined zinc production decreased by 4.3%. Crude steel production increased by 1.9% but no pig iron was produced in 2010. Production of most industrial minerals was estimated to be recovering after having decreased significantly in 2009 owing to difficult economic conditions in the world and decreased construction activity in the country, which affected demand for industrial minerals (table 1; Italcementi Group, 2011, p. 49).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—In December, Dundee Precious Metals Inc. of Canada announced a long-term loan agreement in the amount of $66.75 million with the European Bank for Reconstruction and Development and Unicredit Bulbank. The proceeds of the loan would be used mostly to finance the company's $150 million Chelopech Mine and Mill expansion. As a result of this expansion, the production of both the mine and the mill was expected to double to approximately 2 million metric tons per year of ore. The construction project was scheduled to be finished by the end of 2011 (Dundee Precious Metals Inc., 2010).

Gold.—In June, Euromax Resources Ltd. of Canada announced that drilling at its project in Breznik had extended the strike of the high-grade gold-silver deposit by 120%, or to 2,200 meters (m) from nearly 1,000 m. The company also announced that drilling reports had identified a parallel gold-silver deposit and a previously unidentified gold-copper deposit (Euromax Resources Ltd., 2010).

Iron and Steel.—Stomana Industry S.A., which was a subsidiary of Sidenor S.A. of Greece, announced in November a proposed investment of more than $35 million by the International Finance Corp. of the World Bank Group. This investment would help fund new capital investment, including a new electric arc furnace. This investment was intended to revitalize the company and provide environmental and financial benefits in the long term (Stomana Industry S.A., 2010).

Industrial Minerals

Cement.—Cement production was estimated to have fallen in 2010 as cement consumption in Bulgaria decreased by 22.4% and sales of cement and clinker by the main producers dropped by 33.4% in 2010 compared with consumption and sales in 2009, respectively. Financial distress and a lack of available financing opportunities affected the domestic residential construction market, and an increase in imports contributed to a further drop in production and prices. Public investment in the construction sector was limited because of growing concerns of financial exposure in the public sector (Cembureau, 2011, p. 7; Italcementi Group, 2011, p. 49).

Mineral Fuels

Coal.—Bulgaria's main producer of coal was Mini Maritsa Iztok EAD, which accounted for about 95% of lignite production in Bulgaria. Economic Mining and Power Combine (SMEK) Balkanbass was removed from the list of bituminous coal producers in table 2. No information was available as to when SMEK Balkanbass stopped production of coal, but Mina Balkan 2000 AD was the only reported producer of bituminous coal (table 2; Ministry of Economy, Energy, and Tourism, 2009, p. 11). No coke was produced in 2010 because the production capacity of Kremikovtzi AD (the country's only coke producer) was shut down in late 2008.

Natural Gas.—On January 31, 2009, Melrose Resources S.a.r.l. stopped production at its Galata field in the Black Sea, which had been the only source of natural gas production in Bulgaria. The field was almost depleted, and Melrose planned to convert it into a gas storage facility that would have an eventual capacity of 1.2 billion cubic meters and potentially up

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to 1.8 billion cubic meters. Planning continued as the company waited for various approvals from the Government before continuing work on the project. Melrose also began production in November in two offshore fields in the Black Sea—the Kaliakra deposit, which had reported reserves of 1.4 billion cubic meters, and the Kavarna deposit, which had reserves of 0.7 billion cubic meters (Ministry of Economy, Energy, and Tourism, 2009, p. 6; Melrose Resources Plc., 2011, p. 4–5).

In May 2009, Bulgarian Energy Holding EAD and OAO Gazprom of Russia signed an agreement that established the framework for a feasibility study of the South Stream natural gas pipeline's section through Bulgaria and the establishment of a joint venture to build and operate the pipeline. Following elections in July, a new center-right Government took power in Bulgaria and announced that it wanted to reexamine energy deals made with Russia by the former Socialist Party-led Government. In December, the Bulgarian Energy Ministry and Bulgaria Energy Holding EAD agreed to meet in January 2010 with Gazprom to discuss reestablishing terms for the continuation of the South Stream pipeline project in Bulgaria. The South Stream pipeline had a planned capacity of 63 billion cubic meters per year of natural gas to be transported from Russia to Europe through the Black Sea (Leviev-Sawyer, 2009; OAO Gazprom, 2009, 2010).

On July 13, 2009, Bulgaria, along with Austria, Hungary, Romania, and Turkey, signed an agreement that established the basic legal rules and tariff regulations for the Nabucco natural gas pipeline project. Nabucco was supported by the European Union and the United States and was designed to act as an alternative supply route for natural gas to Europe by transporting 31 billion cubic meters per year of natural gas from Central Asia and the Middle East. Supplies of natural gas for the pipeline were the biggest concern for the project because no source of gas had yet been guaranteed (Offshore, 2009).

Outlook

Improvements in the economic situation in Europe and renewed trade led to a slow recovery of the Bulgarian economy in 2010; however, construction activity in Bulgaria in the residential sector remained poor. A modest increase in domestic demand for mineral commodities in Bulgaria is expected as the economic activity in the country accelerates; the country, however, is likely to remain a modest producer in terms of world production.

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TABLE I

BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum, metal, secondary		12,825	17,330	12,607 [r]	4,107 [r]	12,000
Cadmium, metal, smelter		363	459	460 [e]	420 [e]	420
Copper:						
Ore:						
Gross weight	thousand metric tons	29,572	29,674	27,826	26,936 [r]	27,000
Cu content[e]	do.	124	116	109	110 [e]	110
Concentrate:						
Gross weight	do.	502	502	428	415 [r]	415
Cu content	do.	110	110	105	105	105
Metal, primary and secondary:						
Smelter		238,500	229,100	278,200	276,200	277,000
Refined, electrolytically		65,500	69,900	126,700	196,900	215,100 [3]
Gold, in concentrate	kilograms	3,818	3,964	4,160	4,300 [e]	4,400
Iron and steel, metal:						
Pig iron for steelmaking	thousand metric tons	1,147	1,069	441	--	--
Ferroalloys[e]	do.	10	10	6 [3]	--	--
Steel, crude	do.	2,124	1,909	1,330	726	740
Semimanufactures[e]	do.	1,400	1,400	1,287 [3]	700	700
Lead:						
Mine output, Pb content		10,000	15,000	15,000	12,000 [r]	12,000
Concentrate:						
Gross weight		25,387	23,395	18,503	19,000 [e]	19,000
Pb content		17,771	16,377	12,950	13,000 [e]	13,000
Metal, refined, primary and secondary		76,028	86,956	90,878	83,000	81,000
Manganese ore:						
Gross weight		20,000	28,000	39,000	39,000 [e]	39,000
Mn content[e]		5,600	7,840	10,900	10,900	10,900
Silver, metal[e]	kilograms	65,000	55,000	55,000	55,000	55,000
Tin, metal, secondary[e]		10	2	2	1	1
Zinc:						
Mine output, Zn content		8,000	10,000	10,000	10,000 [r]	10,000
Concentrate:						
Gross weight		25,917	23,474	20,343	20,500 [e]	20,500
Zn content[e]		13,500	12,200	10,600	10,700	10,700
Metal, refined, primary and secondary		95,341	99,992	106,453	92,000	88,000
INDUSTRIAL MINERALS						
Barite ore, run-of-mine[e]		74,500	50,900	40,000	14,300	14,000
Cement, hydraulic	thousand metric tons	4,093	4,413	4,903	3,000 [e]	3,000
Clays:						
Bentonite	do.	134	99	178	108 [r]	100
Kaolin, raw	do.	1,658	1,631	1,530	939 [r]	900
Refractory[e]	do.	18 [3]	15	15	15	15
Feldspar[e]	do.	93 [3]	90	90	80	80
Fluorspar[e]	do.	2	2	2	2	2
Gypsum and anhydrite:						
Crude	do.	216	234	210	128 [r]	130
Calcined[e]	do.	75	75	75	70	70
Lime, industrial	do.	1,409	1,443	1,422	1,300 [e]	1,300
Limestone and dolomite	do.	3,340	3,335	3,340 [e]	3,100 [e]	3,100
Nitrogen, N content of ammonia[e]	do.	309	350	350 [e]	320 [e]	320
Perlite	do.	5	14	7	15 [r]	15
Pyrites, gross weight[e]	do.	150	150	150	150	150
Salt, all types	do.	2,000	2,000	2,100	1,300 [r]	1,300

See footnotes at end of table.

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TABLE 1—Continued

BULGARIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
INDUSTRIAL MINERALS—Continued						
Sand and gravel:						
As reported	thousand cubic meters	4,293	4,925	5,517	2,996 [r]	3,000
Converted[e]	thousand metric tons	6,900	7,900	8,800	8,000	8,000
Silica, quartz sand	do.	250	551	734	657 [r]	660
Sodium carbonate, calcined[e]	do.	800	800	800	800	800
Sulfur:[e]						
S content of pyrites		25,000	25,000	25,000	25,000	25,000
Byproduct		300,000	300,000	300,000	300,000	300,000
Total		325,000	325,000	325,000	325,000	325,000
Sulfuric acid[e]		1,009,500 [3]	1,010,000	1,010,000	1,000,000	1,000,000
Zeolite[e]		15,000	15,000	15,000	15,000	15,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Bituminous	thousand metric tons	52	18	19	23 [r]	25
Brown	do.	2,557	2,834	2,643	2,244 [r]	2,200
Lignite	do.	22,750	25,325	26,008	24,700 [e]	25,000
Total	do.	25,359	28,177	28,670	26,967 [r]	27,200
Coke	do.	668	525	337	--	--
Natural gas, marketed	million cubic meters	519	295	218	12	12
Petroleum:[4]						
Crude	thousand 42-gallon barrels	183	176	169	176	180
Refinery products:[e]	do.	54,600	54,400	54,500	50,000	50,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through August 19, 2011.

[2]In addition to the commodities listed, bismuth, chromite, magnesite, palladium, platinum, tellurium, and a variety of crude construction materials (common clays, dimension stone, and crushed stone) may be produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Figures were converted to barrels from production reported in thousand metric tons, which was reported as the following: Crude petroleum production in 2005—27; 2006—25; 2007—24; 2008—23; 2009—24; and 2010—24 (estimated). Petroleum products in 2005—5,971; 2006—6,829; 2007—6,806; 2008—6,812; 2009—6,255; and 2010—6,250 (estimated).

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TABLE 2
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bentonite, mine output		Bentonit AD (S&B Industrial Minerals AD)	Kardzhali	NA.
Cadmium		KCM S.A.	Plovdiv	300.
Do.		Lead and Zinc Complex Plc. (LZC) (Intertrust Holding, 90%)	Kardzhali	150.[e]
Cement		Devnya Cement (Italcementi Group)	Devnya	2,000.
Do.		Vulkan Cement (Italcementi Group)	Dimitrovgrad	500.
Do.		Holcim Bulgaria AD (Holcim Ltd.)	Pleven Plant and Beli Izvor Plant	2,400.
Do.		Titan Zlatna Panega	Zlatna Panega	1,500.
Coal:				
Bituminous		Mina Balkan 2000 EAD	Central Bulgaria	NA.
Brown		Otkrit Vagledobiv Mines EAD	Pernik coal basin, southwest of Sofia	2,000.[e]
Do.		Vagledobiv Bobov Dol EOOD	Bobov Dol coalfield	1,000.[e]
Do.		Other small producers	Eastern and western Bulgaria	1,000.[e]
Lignite		Mini Maritsa Iztok EAD (state owned)	East Maritsa coal basin near Radnevo	25,000.[e]
Do.		Other small producers	Sofia, Pernik, and Bobov Dol coal basins	5,000.[e]
Coke		Kremikovtzi A.D.	About 10 kilometers northeast of Sofia	NA.
Copper:				
Concentrate, Cu content		Assarel-Medet JSC	Panagurishte, Pazardzhik District	57.
Do.		Ellatzite-Med AD	Mine 8 kilometers south of Etropole, concentrator near Mirkovo village	45.
Do.		Dundee Precious Metals Inc.	Chelopech	13.
Do.		Bradtze	Malko Turnovo	2.
Do.		Burgaskii Mines Ltd., Zidorovo	Burgas, near the Black Sea	1.
Metal:				
Smelter		Aurubis Bulgaria AD (Aurubis AG)	Pirdop	275.
Refinery		do.	do.	200.
Gold, in concentrate	kilograms	Dundee Precious Metals Inc.	Chelopech	2,500.[e]
Do.	do.	Ellatzite-Med AD	Mine 8 kilometers south of Etropole and concentrator near Mirkovo village	NA.
Iron ore		Kremikovtzi A.D.	About 10 kilometers northeast of Sofia	NA.
Kaolin, mine output		Kaolin AD	Senovo, Rousse District	NA.
Lead-zinc:				
Concentrate, Pb-Zn content		Gorubso Co. (Intertrust Holding)	Erma Reka, Kardzhali, Laki and Zlatograd, all in Madan area near Greek border	59 lead, 47 zinc.
Do.		Osogovo Ltd.	Osogovo Mountains, western Bulgaria	3 lead, 2 zinc.
Do.		Rudmetal JSC	Dimov Dol Mine, near Rudozem	3 lead, 2 zinc.
Metal:				
Pb, refined		KCM S.A.	Plovdiv	65.
Do.		Lead and Zinc Complex Plc. (LZC) (Intertrust Holding, 90%)	Kardzhali	33.
Zn, smelter		KCM S.A.	Plovdiv	75.
Do.		Lead and Zinc Complex Plc. (LZC) (Intertrust Holding, 90%)	Kardzhali	28.
Manganese ore		Obrochishte Mine (Euromangan AD)	Tsarkva village, 10 kilometers west of Balchik	NA.
Natural gas	million cubic meters	Melrose Resources S.a r.l. (Melrose Resources Plc., 100%)	Galata field, in the Black Sea off the coast of Varna	NA.
Do.	do.	Oil and Gas Exploration and Production Plc.	Gasfield concessions near Dolni Dubnik, Selanovtzi, and others	NA.
Perlite, mine output		Bentonit AD (S&B Industrial Minerals AD)	Kardzali	NA.

See footnotes at end of table.

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TABLE 2—Continued
BULGARIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:				
Crude		Oil and Gas Exploration and Production Plc.	Tyulenovo, Dolni Dubnik, Dolni Lukovit, Gorni Dubnik, and other oilfields	NA.
Refined	42-gallon barrels per day	Lukoil Neftochim Bourgas AD	Refinery at Burgas	215,000.
Silver:				
In concentrate	kilograms	Dundee Precious Metals Inc.	Chelopech	3,200.[e]
Metal		KCM S.A.	Plovdiv	100.
Steel, crude		Kremikovtzi A.D.	About 10 kilometers northeast of Sofia	NA.
Do.		Stomana Industry S.A. (Sidenor S.A., 100%)	Pernik	1,400.
Zeolite, mine output		S&B Industrial Minerals A.D.	Kardzali	15.[e]

[e]Estimated. Do., do. Ditto. NA Not available.

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THE MINERAL INDUSTRY OF CROATIA

By Mark Brininstool

Croatia produced a limited number of mineral commodities, none of which were produced in a quantity that was significant on a world scale. In 2010, Croatia's gross domestic product (GDP) decreased by 1.2% compared with the GDP in 2009. In 2009 (the latest year for which data were available), Croatia imported about $2.3 billion[1] worth of mining and quarrying products and exported only about $334 million. Imports of crude oil and natural gas accounted for about $2.1 billion of the imports. Crude oil made up about 8.3% of the value of all Croatian imports and was the most important imported product in terms of value; natural gas made up about 2.1% of all Croatian imports and was the third most valuable imported product. For the foreseeable future, Croatia will most likely remain a modest producer of mineral commodities and continue to be heavily dependent on imports of mineral fuels (Croatian Bureau of Statistics, 2010, p. 369, 379; 2011, p. 44).

Production

Crude steel, production of which increased by 100% compared with that of 2009, was the only mineral commodity produced in Croatia for which output was reported to have increased. Production of lime decreased by 47% compared with that of 2009; sulfur production, by 32%; crushed and brown stone, by 25%; gypsum and anhydrite, by 21%; and silica sand, by 13%. Production of carbon black was temporarily halted by Petrokemija d.d. owing to a lack of consumer demand (Petrokemija d.d., 2011, p. 10).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities in Croatia.

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[1]Where necessary, values have been converted from Croatian kuna (HRK) to U.S. dollars (US$) at the rate of HRK0.18=US$1.00.

TABLE 1
CROATIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum:[3]						
Alloys		31,573	32,703	31,582	30,000 [e]	30,000
Semimanufactures:						
Rolled		48,785	49,050	52,135	50,000 [e]	50,000
Extruded		6,670	6,953	6,287	6,000 [e]	6,000
Total		55,455	56,003	58,422	56,000 [r,e]	56,000
Steel:						
Crude, from electric furnaces		80,516	76,252	121,759	51,583	103,000 [4]
Semimanufactures, hot rolled[e]		60,000	75,000	121,000	51,000	103,000
INDUSTRIAL MINERALS						
Cement	thousand metric tons	3,598	3,587	3,637	2,823	2,664 [4]
Clays:						
Bentonite		16,410	19,578	19,759	-- [r]	-- [e]
Ceramic clay[e]		300,718 [4]	300,000	300,000	300,000	300,000
Gypsum and anhydrite, crude		170,351	334,962	329,649	221,888 [r]	176,000 [4]
Lime	thousand metric tons	260	572	541	350 [r]	186 [4]
Nitrogen, N content of ammonia[e]	do.	300	300	300	300 [r]	300
Pumice and related materials, volcanic tuff[e]	do.	17 [4]	15 [4]	15	15	15
Salt, all sources[e]		29,589 [4]	32,536 [4]	30,000 [r]	30,000 [r]	30,000
Sand and gravel, excluding glass sand[e]		365,550 [4]	350,000	350,000	350,000	350,000
Silica sand (quartz, quartzite, glass sand)		139,730	147,855	150,000 [e]	278,231 [r]	241,000 [4]

See footnotes at end of table.

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TABLE 1—Continued
CROATIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
INDUSTRIAL MINERALS—Continued						
Stone:[e]						
Crushed and brown	thousand metric tons	17,625 [4]	18,000	18,000	17,652 [r,4]	13,270 [4]
Dimension stone		1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Sulfur, byproduct of petroleum		7,500 [e]	7,500 [e]	9,819	10,315	7,000 [4]
MINERAL FUELS AND RELATED MATERIALS						
Carbon black		26,265	23,724	16,903	3,976	– [4]
Natural gas, gross production	million cubic meters	2,715	2,892	2,729	2,705 [r]	2,727 [4]
Petroleum:[e]						
Crude, gross weight, includes condensate[5]	thousand 42-gallon barrels	6,800	6,520	6,200	5,760	5,340
Refinery products[6]	do.	36,400	39,900	32,100	31,700	31,200

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto.
[1]Table includes data available through October 24, 2011.
[2]In addition to commodities listed, common clay and other industrial minerals may have been produced, but available information was inadequate to make reliable estimates of output.
[3]Crude aluminum had not been produced in Croatia since 1991 when Tvornica Lakih Metala (TLM) d.o.o. stopped production.
[4]Reported figure.
[5]Figures were converted to barrels from metric tons. The reported data, in thousand metric tons, were as follows: 2006—917; 2007—879; 2008—835; 2009—776; and 2010—720.
[6]Figures were converted to barrels from metric tons. The reported data, in thousand metric tons, were as follows: 2006—4,865; 2007—5,321; 2008—4,196; 2009—4,246; and 2010—4,200 (estimated).

TABLE 2
CROATIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Aluminum alloys and semimanufactures		Tvornica Lakih Metala (TLM) d.o.o. (Adrial d.o.o. Sibenik)	Sibenik	40 [e]
Do.		Top-Tvornica Olovni i Aluminijskih	Savska	NA
Carbon black		Petrokemija d.d.	Kutina	NA
Cement		Cemex Hrvatska d.d. (CEMEX S.A.B. de C.V., 100%)	Plants at Kastel Sucurac, Solin, and Solin Majdan	2,400
Do.		Holcim (Hrvatska) d.o.o.	Plant at Koromacno	1,000
Do.		Istra Cement International d.d. (Part of CALUCEM Group)	Plant at Pula	NA
Do.		Tvornica Cementa Umag d.o.o.	Cement plant at Umag	350
Do.		Nasicecement d.d. (Nexe Grupa d.d.)	Nasice	1,000
Natural gas	million cubic meters	INA-Industrija Nafte d.d. Zagreb (INA)	Natural gasfields at Molve, offshore platforms in the Adriatic Sea, and other locations	3,000
Petroleum:				
Crude	thousand 42-gallon barrels per day	do.	Oilfields at Kalinovac, Sandrovac, Struzec, Zutica, and other locations.	20 [e]
Refined		do.	Refinery at Rijeka (Urinj)	3,500
Do.		do.	Refinery at Sisak	2,300
Salt		Solana Pag d.d.	Pag Island (marine salt)	NA
Steel, crude		CMC Sisak d.d. [Commercial Metals Co. (CMC)]	Plant at Sisak	80
Do.		Zeljezara Split d.d. (Zlomrex S.A., 94.8%)	Plant at Split	185 [1]

[e]Estimated. Do., do. Ditto. NA Not available.
[1]Zeljezara Split d.d. stopped production in early 2009 and production remained suspended throughout 2010.

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THE MINERAL INDUSTRY OF CYPRUS

By Harold R. Newman

The mineral resources of Cyprus[1] included asbestos, chromite, copper, gypsum, lime, sand and stone, and umber. In 2010, mining made only a small contribution to the national economy.

The Mines Service of the Ministry of Agriculture, Natural Resources, and Environment administered mineral operations under the Mines and Quarries (Regulation) Law, chapter 270, 1959; the Mines and Quarries Regulations, 1958–79; and the Cyprus Standard and Control of Quality Law 1975. The Geological Survey Department was placed under the auspices of the Ministry of Agriculture and Natural Resources in the late 1960s and was responsible for the mineral exploration programs and for evaluating the country's mineral resources (Ministry of Agriculture, Natural Resources and Environment, 2010).

The gross output of the mining and quarrying sectors in 2010 was valued at €90.4 million ($120.7 million[2]) which was an increase of 9% compared with that of 2009, whereas the output value of value-added products also increased by 9.7% to €55.5 million ($74 million) compared with that of 2009. The number of people employed in the mining and quarrying sector was 585, which was a decrease of 0.5% (Statistical Service of the Republic of Cyprus, 2010).

Cyprus became a full member of the European Union (EU) on May 1, 2004, and its membership in the euro area became effective on January 1, 2008. The Government replaced the Cyprus pound (C£) with the euro after the country joined the euro area. In 2010, the C£ could be exchanged only at the country's banks (U.S. Department of State, 2010).

International trade was important to the economy of Cyprus. On the production side, the lack of energy resources for the production of heavy goods and the lack of raw materials necessitated the importation of these mineral commodities. Cyprus, on the other hand, exported agricultural production, manufactured products, and mineral commodities. The EU and Cyprus's neighbors in the Middle East absorbed the majority of Cyprus's exports and supplied the majority of Cyprus's imports (PriceWaterhouseCoopers, 2010).

U.S. exports to Cyprus in 2010 totaled $134 million and included $1.4 million in specialized mining equipment, $1.2 million in finished metal shapes, $684,000 in excavating equipment, $595,000 in iron and steel mill products, and $285,000 in petroleum products (U.S. Census Bureau, 2010a). U.S. imports from Cyprus in 2010 totaled $11 million. This included $1 million in sulfur and nonmetallic minerals, $307,000 in nickel, and $90,000 in industrial chemicals (U.S. Census Bureau, 2010b).

[1]Unless specifically stated, all data in this chapter are for the Republic of Cyprus in southern Cyprus because data related to areas of northern Cyprus administered by Turkish Cypriots were sparse or unavailable. The two areas have been separated since 1974.

[2]Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at a rate of €1.00 = US$1.33.

Production

Data on mineral production are in table 1. Bentonite, cement, sand and gravel, and stone were the major mineral commodities, in terms of value, produced by the mineral industry of Cyprus. Other mineral commodities produced included common clay for brick and cement manufacture, gypsum, ocher, and umber. In 2010, cement production increased by 10% compared with that of 2009 (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities and their locations. All facilities were privately owned.

Commodity Review

Metals

Copper.—Copper exploration areas in Cyprus were centered on the Troodos ophiolite complex. The targeted mineralization type was volcanic-hosted massive sulfide (VMS) deposits under shallow cover rocks. These deposits were similar in type to those of the country's larger historical copper mines, three of which had reserves that exceeded 10 million metric tons (Mt) of ore at grades of between 1% and 4.5% copper (Minesite.com, 2010).

EMED Mining Public Ltd., which was a Cyprus-based mineral development and exploration company, considered its Klirou copper-zinc property a high-priority project. The project is located about 20 kilometers southwest of Nicosia. Exploration was primarily within the Upper Pillow Lavas of the Troodos complex. The Klirou deposit extends from the surface to about 200 meters (m) below the surface and was potentially minable by open pit methods (EMED Mining Public Ltd., 2010).

Northern Lion Gold Corp. of Canada announced an update on its projects in Cyprus, including results from a diamond drilling program at the Philani and the Red Rocks deposits. At Philani, historical data had indicated the presence of a large VMS body at shallow depth containing high copper and zinc values. The drill program was designed to confirm the presence of this VMS body and to provide core samples to understand better the structure and mineralogy of the sulfides. Northern Lion announced the results of the drill samples to be 5.1% copper and 5.7% zinc across 9 m. Mapping and surface sampling located a series of gossan outcrops following a northwest-trending structure along the west edge of the known VMS deposit. Surface rock sampling had returned a high value of 4.4 grams per metric ton (g/t) gold from this gossan. Similar gossans were located to the southeast of the VMS deposit (Northern Lion Gold Corp., 2010).

Gold.—Northern Lion began exploring for gold in the Troodos complex in January and announced that, as of

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September, significant amounts of gold and other valuable minerals had been discovered. One sample at the Anglisides site was reported to assay at 50 g/t gold. Drilling was continuing at the Anglisides and the Pitha sites in the Larnaca district to build a clearer picture of the amount of ore in these deposits. Northern Lion received approval to explore in the Asproyia, the Limni, and the Paphos areas; the company also had two permits for the Klirou area, along with five more permits adjacent to these areas that covered about 20.7 square kilometers (Dewhurst, 2010).

Industrial Minerals

The sedimentary rocks of Cyprus are rich in industrial minerals, including aggregates, bentonite, building stone, chalk, clay, gypsum, and limestone. Information regarding ownership, location, and production of these resources was not readily available, however.

Mineral Fuels

Natural Gas and Petroleum.—Cyprus produced no natural gas or petroleum in 2010. Energy constituted one of the most important sectors of the country. The energy sector was characterized by a high dependence on imported energy, a dominance of petroleum in the energy balance, a rapid growth in energy demand, and difficulty interconnecting with European networks owing to Cyprus's geographic location (Ministry of Commerce, Industry and Tourism, 2010).

Vitol Tank Terminals International BV (VTTI) of the Netherlands announced that it had plans to build a petroleum import and distribution terminal in the industrial area of Vassiliki. The $129 million terminal, which was scheduled for completion in 2012, would establish Cyprus as a major petroleum trading hub. The terminal would be linked in with VTTI's storage and refinery asset in Fujeirah, United Arab Emirates, which was one of the largest oil bunkering ports in the world, and would help facilitate the supply of petroleum products to the Middle East region. Petroleum products would arrive at the new terminal from the international oil markets and be reexported to regional markets, as well as supply the domestic market in Cyprus (Arabianoilandgas.com, 2010).

Outlook

In 2010, domestic industrial infrastructure construction is expected to continue to be the main source of domestic demand for cement, gypsum, sand and gravel, and stone and to be a significant contributor to the national economy. International demand is expected to continue to support Cypriot exports of bentonite, gypsum, perlite, and umber. Natural gas and petroleum exploration is expected to continue.

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TABLE 1
CYPRUS: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009[e]	2010[e]
Cement, hydraulic		1,786	1,873	1,914	1,481 [3]	1,674 [3]
Clays:						
Bentonite	metric tons	150,620	154,655	155,125	152,722 [3]	162,169 [3]
Other:						
For brick and tile manufacture		400 [e]	476	490	480	480
For cement manufacture		540	620	635	400 [3]	400
Total		940 [e]	1,096	1,125	880	880
Copper, refined	metric tons	880	3,012	2,986	2,380	2,595 [3]
Gypsum, crude[4]	do.	264,000	304,000	405,500	317,000	333,300 [3]
Lime, hydrated	do.	12,715	13,497	14,285	12,000 [3]	12,000
Sand and stone:						
Limestone, crushed (Havara)		700	875	766	800	800
Marble, granules and chippings	metric tons	100	800	550	400	1,195 [3]
Marl, for cement production		2,210	2,540	2,595	2,600	2,600
Sand and gravel[5]		12,199	13,129	14,174	11,468 [r,3]	12,981 [3]
Building stone[6]		57	38	71	70	80
Umber	metric tons	5,757	4,363	4,471	4,363 [3]	4,500

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto.

[1]Table includes data available through December 31, 2011.

[2]In addition to the commodities listed, small quantities of the mineral pigments ocher and terra verte are mined intermittently. Mineral production data from areas of northern Cyprus that are administered by Turkish Cypriots and the production of fertilizers, perlite, and secondary metals from scrap are not included in this table because available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]About 4,000 metric tons per year of gypsum was calcined.

[5]Includes crushed aggregate.

[6]Includes crude, semifinished, and worked stone.

TABLE 2
CYPRUS: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity	Major operating companies and and major equity owners	Location of main facilities	Annual capacity
Aluminum:			
Secondary	A & E Aluminium Recycling Ltd.	Nicosia	NA
Semimanufactures	Muskita Aluminum Industries Ltd.	Extrusion presses, Limassol	18,000
Cement	Vassiliko Cement Works Ltd.	Vassiliko	1,260,000
Do.	Cyprus Cement Co. Ltd.	Moni	400,000
Do.	Bogaz Endustri ve Madencilik	Near Famagusta, northern Cyprus	150,000
Clay, bentonite	Peletico Penta Ltd.	Mines at Pentakomo and Troulli	NA
Do.	Hellenic Mining Co.	Nicosia	NA
Do.	Drapia Mining Co. Ltd.	Drapia, Monagroulli, and Parsata	(1)
Do.	Oryktako Ltd.	Mine at Kato Moni and processing plant at Malounda	10,000
Do.	C & A Quarries Ltd.	NA	NA
Copper, cathode	Hellenic Copper Mines Ltd.	Skouriotissa	(1)
Gypsum	Peletico Ltd.	Quarry and processing plant at Aradipou, near Larnaca	NA
Do.	Zeiplast Chemical Industries Ltd.	Near Moni	NA
Do.	Various	Eledhio and Tuchni	NA
Perlite	Peletico Ltd.	Expanded perlite facility at Larnaka	NA
Do.	Zeiplast Chemical Industries Ltd.	Expanded perlite facility at Moni	NA
Refined petroleum products thousand 42-gallon barrels	Cyprus Oil Terminal Ltd.	Larnaca storage facility	150
Steel, semimanufactures	B.M.S. Metal Pipes Industries Ltd.	Tube and pipe mill, Paphos	15,000

Do. Ditto. NA Not available.

[1]Inactive since 2008.

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THE MINERAL INDUSTRY OF THE CZECH REPUBLIC

By Alberto Alexander Perez

The Czech Republic was an important Central European producer of heavy industrial goods manufactured by the country's chemical, machine building, and toolmaking industries. Coal, coke, and steel production were of domestic and regional importance. The production of coal for thermal powerplants and the use of nuclear power were important sources of electricity and helped the country maintain a lower level of dependence on imported natural gas for electricity production than other countries in Central and Eastern Europe.

Minerals in the National Economy

The Czech Republic's real gross domestic product (GDP) increased by 2.7% in 2010 compared with the GDP in 2009. Industrial manufacturing was the largest component (37.6%) of the country's GDP; its main manufactured products were machinery and equipment, metallurgy, and motor vehicles. Mining and quarrying activities, which were valued at $2.3 billion,[1] made up only about 1% of the total GDP. Mineral commodities made up a relatively small share of total external trade, and the only mineral commodity trade of significance was mineral fuel imports. In 2009 (the latest year for which data were available), the Czech Republic imported 208,800 barrels per day of crude oil and 8.51 billion cubic meters of natural gas. About 73% of crude oil imports and an estimated 75% of natural gas imports were imported from Russia (Czech Geological Survey, 2010, p. 191, 205; Czech Statistical Office, 2010a–c; U.S. Central Intelligence Agency, 2011).

Government Policies and Programs

Three main laws are applicable to the mineral industry in the Czech Republic. Act No. 44/1988 on the Protection and Use of Mineral Resources (the Mining Act), as amended, defines the minerals that are owned by the Government, establishes the authority of certain Government agencies with respect to mining activity, and sets out other rules on the management of mineral resources in the Czech Republic. The Czech National Council Act No. 62/1988, on Geological Work (the Geological Act), as amended, establishes the rules for prospecting and exploration of most mineral deposits. Act No. 61/1988 on Mining Operations, Explosives and on the State Mining Administration, as amended, defines appropriate mining methods. The Ministry of the Environment enforces environmental laws in the mining sector and has the authority to revoke exploration and mining leases if environmental laws are violated (Czech Geological Survey, 2010, p. 27–28).

In 1991, the Czech Government passed Government Resolution No. 444/1991, which established geographic limits on the expansion of coal and uranium mining. It was estimated that about 750 million metric tons (Mt) of brown coal reserves as well as some uranium reserves were located in areas where mining is restricted. In October 2009, the Energy and Trade Ministry stated in its 5-year energy plan that it wanted to renew mining in some restricted areas, which set off protests by environmentalists and other groups. The energy plan had not been passed by the end of 2009, and the renewal of mining in restricted areas remained under consideration (Delbos, 2009; Czech Coal Group, 2010, p. 75).

Production

In 2010, the Czech Republic saw increases in its production of bentonite (57.8%), kaolin (21%), hot-rolled steel semimanufactures (16.5%), pig iron (14.5 %), dolomite (14.2%), and crude steel (12.8%), among the most significant. Also, there were significant decreases in the production of gypsum (61.5%), crude petroleum (21.8%), and common sand and gravel (18.5%). In 2009, the Czech Republic was especially affected by reduced demand in the European Union (EU), where its major trade partners are located, and by the domestic slowdown in construction investment, which was estimated to have fallen by 10%. A recovery began to take place in 2010, however, because of increased demand for the country's products abroad (table 1; Czech Geological Survey, 2010, p. 46).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Iron and Steel.—The Czech Republic had no economically exploitable iron ore deposits and imported all iron ore products used in primary steel production. In 2008 (the latest year for which data were available), about 7.7 Mt of iron ore and concentrate was imported by the Czech Republic; about 60% of these imports came from Ukraine and about 27% came from Russia. ArcelorMittal Ostrava a.s. and Třinecké železárny a.s. were the only producers of pig iron and combined accounted for about 80% of the total crude steel production in the Czech Republic. Crude steel production increased in 2010 owing to the increased demand for steel products, particularly for the automotive industry (Czech Geological Survey, 2010, p. 456–465; Czech Statistical Office, 2010a; World Steel Association, 2011).

Mineral Fuels and Related Materials

Coal.—The Czech Republic was self-sufficient in coal production. Production by the Czech Republic's only

[1]Where necessary, values have been converted from Czech koruna (CZK) to U.S. dollars (US$) at the rate of CZK19.09=US$1.00.

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bituminous coal miner, OKD a.s., had been negatively affected by reduced steel production in Europe in 2009 and the accompanying reduction in demand for coking coal. Demand, however, increased in 2010 as production in the steel industry was reactivated. OKD reported Joint Ore Reserves Committee (JORC)-compliant reserves of about 206 Mt of bituminous coal and produced 11.2 Mt of coal in 2010 (OKD a.s., 2010, p. 16–17).

If current mine expansion restrictions stipulated by Government Resolution No. 444/1991 in 1991 are not lifted, the Czech Coal Group's CSA Mine planned to reduce coal production to about 2.5 million metric tons per year (Mt/yr) from about 5 Mt/yr after 2012 and to continue to produce at this rate until 2020. The Czech Coal Group reported that the CSA Mine had 37.3 Mt of coal reserves within the current mining limits, but that there were 750 Mt of reserves located beyond the mining limit that could significantly extend the life of the mine if the limits were expanded. At the Vrsany Mine, the Sverma site had only about 8.6 Mt of reserves remaining and was expected to close by 2012. The Vrsany site had about 305.5 Mt of reserves, and the Czech Coal Group estimated that it would be able to produce at the rate of 7 Mt/yr until 2052. The Czech Coal Group planned to continue to produce about 280,000 metric tons per year at the Centrum Mine until 2012, when the mine would be closed. The two other brown coal producers, Severočeské doly a.s. and Sokolovská uhelná a.s., produced 22.4 Mt and 8.6 Mt of brown coal, respectively, in 2009 (the latest year for which data were available). Under current geographic coal mining restrictions, the Czech Coal Group's subsidiary Czech Coal a.s. estimated that production of brown coal in the Czech Republic would be 45 Mt/yr until 2013, 40 Mt/yr from 2013 until 2021, 33 Mt/yr from 2021 until 2023, 26.5 Mt/yr from 2023 until 2032, 17.5 Mt/yr from 2032 until 2039, 8.5 Mt/yr from 2039 until 2044, and 7 Mt/yr from 2044 until 2052 when brown coal mining would completely stop (Czech Coal Group, 2009; 2010, p. 26, 28, 30, 72; Severočeské doly a.s., 2010, p. 13; Sokolovská uhelná a.s., 2010, p. 2).

Lignit Hodonin s.r.o., which was the Czech Republic's only lignite mining company, was declared insolvent in September. As a result, no lignite was mined in the Czech Republic in 2010 (Czech Business Weekly, 2010).

Uranium.—DIAMO s.p. remained the only domestic producer of uranium, and it supplied CEZ a.s. (the owner of the Czech Republic's two nuclear powerplants) with about one-third of the uranium it required. All domestically produced uranium was sent to Russia for processing into fuel. All nuclear fuel for the Dukovany Nuclear Power Station was purchased from the Russian firm OAO TVEL, whereas the Temelin Nuclear Power Station obtained its fuel from Westinghouse Electric Company LLC of the United States. The supplies of fuel from Westinghouse were scheduled to end in 2010, after which time the fuel for Temelin would be supplied by OAO TVEL. CEZ's nuclear powerplants produced about 33% of all electricity in the Czech Republic in 2009. Uran Ltd. of Australia's applications for exploration licenses in the Brzkov and Liberec regions were rejected, but the company had filed an appeal of the decision (CEZ Group, 2010, p. 96; Severočeské doly a.s., 2010, p. 54, Uran Ltd., 2010, p. 7).

Outlook

The Czech Republic began an economic recovery in 2010. The crisis that had reduced the demand for Czech mineral products both domestically and in export markets seemed to subside slowly, principally as a result of the global increase in demand for steel for use in automotive manufacturing. Dependence on imports of natural gas and petroleum is likely to continue to affect the trade balance negatively, but production of coal will likely remain stable and provide a significant portion of the country's fuel requirements for electricity generation.

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TABLE 1

CZECH REPUBLIC: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Aluminum, metal, secondary[e]		40,000	48,000	47,000	45,000	45,000
Iron and steel, metal:						
Pig iron	thousand metric tons	5,192	5,287	4,737	3,483	3,987
Steel, crude	do.	6,862	7,059	6,387	4,594	5,180
Semimanufactures, hot rolled	do.	6,273	6,101	5,801	3,957 r	4,608
Lead, metal, secondary		29,000	34,000	36,000	29,000 r	30,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	4,239	4,899	4,710	3,637	3,345
Clays:						
Bentonite	do.	267	335	174	116	183
Kaolin	do.	3,768	3,604	3,833	2,886	3,493
Other	do.	561	679	574	377	429
Diatomite		53,000	19,000	31,000	--	32,000
Dolomite		409,000	385,000	449,000	337,000	385,000
Feldspar		487,000	514,000	488,000	431,000	388,000
Gemstones, crude, pyrope-bearing rock		39,000	34,000	24,000	22,000 e	22,000 e
Graphite		5,000	3,000	3,000	--	--
Gypsum and anhydrite, crude		16,000	66,000	35,000	13,000	5,000
Lime, hydrated and quicklime	thousand metric tons	1,186	1,277	1,150	1,000 e	1,000 e
Nitrogen, N content of ammonia[e]		250,000	225,000	200,000	200,000	200,000
Sand and gravel:						
Common sand and gravel	thousand metric tons	27,198	28,233	27,306	23,614	19,240
Foundry sand	do.	773	850	702	374	473
Glass sand	do.	963	942	1,151	990	888
Stone:						
Dimension stone	do.	802	788	723	704	823
Limestone and other calcareous stones	do.	10,193	11,279	11,465	9,489	9,828
Crushed stone	do.	41,561	43,214	44,277	38,302	37,270
Sulfur, byproduct, all sources[e]		45,000	45,000	45,000	40,000	40,000 e
Sulfuric acid		263,000 e	275,900	215,000	200,000 e	200,000 e
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	13,017	12,462	12,197	10,631	11,193
Brown and lignite	do.	49,374	49,571	47,872	45,616	43,931
Total	do.	62,391	62,033	60,069	56,247	55,124
Coke	do.	3,428	3,258	3,399	2,400 e	2,400 e
Fuel briquets from brown coal	do.	345	247	156	150 e	150 e
Gas:						
Manufactured, all types[e]	million cubic meters	1,400	1,411 [3]	1,442 [3]	1,000	1,500
Natural, marketed	do.	148	148	168	180	201
Petroleum:[e]						
Crude[4]	thousand 42-gallon barrels	1,800	1,600	1,600	1,500	1,173
Refinery products[5]	do.	55,000	52,000	58,000	52,000	52,000 e
Uranium:						
Mine output, U content		383	322	290	286	259
U_3O_8 content[e]		452	380	342	337	305
Concentrate production, U content		358	291	261	243	237

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through December 12, 2012.

[2]In addition to the commodities listed, ferrovanadium, secondary copper, precious metals, and zinc metal may have been produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Figures were converted to barrels from production reported in thousand metric tons, which was reported as the following: 2006—259; 2007—240; 2008—236; 2009—217; and 2010—173.

[5]Figures were estimated based on throughput reported in million metric tons, which was reported as the following: 2006—7.87; 2007—7.40; 2008—8.25; 2009—7.38; and 2010—7.38 (estimate).

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TABLE 2
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, secondary		Alcan Decin Extrusions s.r.o.	Decin, northern Bohemia	NA
do.		Kovohute Holdings DT, Mnisek Division (majority owned by Demonta Trade SE)	Mnisek pod Brdy	NA
Bentonite		Keramost a.s.	Most	NA
do.		LITH s.r.o.	Male Chvojno	NA
Cement		Ceskomoravsky Cement a.s. (Heidelberg Cement AG, 100%)	Mokra	1,200 e
Do.		do.	Radotin	650 e
Do.		Lafarge Cement a.s.	Cizkovicka	1,200
Do.		Holcim (Cesko) a.s.	Prachovice	1,400
Do.		Cement Hranice a.s. (Dyckerhoff, 100%)	Hranice	1,100
Clay		Ceske Lupkove Zavody a.s.	Nove Straseci (refractory clay)	NA
Do.		Chlumcanske Keramicke Zavody a.s.	Chlumcany (kaolin)	NA
Do.		Kaolin Hlubany a.s. (WBB Minerals, 94%)	Podborany	NA
Coal:				
Bituminous		OKD a.s. (New World Resources N.V.)	4 mines near Ostrava and Kravina in eastern Czech Republic	13,000 e
Brown		Severočeské doly a.s. (CEZ Group)	Nastup Tusimice Mine southwest of Chomutov and Bilina Mine in Bilina	23,000 e
Do.		Litvinovska uhelna a.s. (Czech Coal Group)	CSA Mine near Most	5,000 e
Do.		Vrsanska uhelna a.s. (Czech Coal Group)	Vrsany Mine just west of Most (it includes the Vrsany and Sverma sites)	10,000 e
Do.		Dul Kohinoor a.s. (Czech Coal Group)	Centrum Mine in Marianske Radcice	350 e
Do.		Sokolovská uhelná a.s.	Jiri and Druzba Mines at Sokolov	10,000 e
Lignite		Lignit Hodonin s.r.o.	Hodonin, south Moravia	500
Coke		ArcelorMittal Ostrava a.s.	Ostrava	1,500
Do.		OKK Koksovny a.s. (New World Resources N.V.)	Jan Sverma coking plant near Ostrava	400
Do.		do.	Svoboda coking plant near Ostrava	600
Do.		Třinecké železárny a.s. (Moravia Steel a.s., 69%)	Trinec	700
Ferrovanadium		Nikom a.s. (Evraz Vitkovice Steel a.s.)	Vitkovice-Ostrava	NA
Gold, metal, secondary		Kovohute Pribram Nastupickna a.s.	Pribram	NA
Graphite		Grafitove doly Stare Mesto s.r.o.	Stare Mesto	NA
Lead, metal, secondary, refined		Kovohute Pribram Nastupickna a.s.	Pribram	30
Natural gas	million cubic meters	Gasfield operators in Brno and Ostrava regions, including: Moravske Naftove doly a.s. Ceska Naftarska Spol s.r.o. Green Gas DPB a.s. UNIGEO a.s.	Eastern/southeastern Czech Republic, of which: Hodonin do. Paskov Ostrava-Hrabova	200 e, 1
Petroleum:				
Crude	thousand 42-gallon barrels	Oilfield operators around Hodonin, including: Moravske Naftove doly a.s. Ceska Naftarska Spol s.r.o. UNIGEO a.s.	Of which: Hodonin do. Ostrava-Hrabova	2,100 e, 1
Refinery	thousand 42-gallon barrels per day	Paramo a.s. (Unipetrol a.s.)	Refineries at Kolin and Pardubice	20 e
Do.	do.	Ceska Rafinerska (Unipetrol a.s., 51.2%, Eni International B.V., 32.5%, Shell Overseas Investments B.V., 16.3%)	Refineries at Litvinov and Kralupy nad Vltavou	165 e
Pig iron		Třinecké železárny a.s. (Moravia Steel a.s., 69%)	Trinec	2,100
Do.		ArcelorMittal Ostrava a.s. (ArcelorMittal, 83%)	Kunice-Ostrava	3,000
Steel, crude		do.	do.	3,000
Do.		Třinecké železárny a.s. (Moravia Steel a.s., 69%)	Trinec	2,440
Do.		Evraz Vitkovice Steel a.s.	Vitkovice-Ostrava	950
Do.		Vitkovice Heavy Machinery a.s.	do.	200

See footnotes at end of table

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TABLE 2—Continued
CZECH REPUBLIC: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued:			
Do.	Pilsen Steel s.r.o. (OAO OMZ)	Plzen	150
Do.	Poldi Hutte s.r.o. (Scholz Edelstahl A.G.)	Kladno	120 [e]
Do.	Zelezarny Hradek a.s. (Z-Group Steel Holding)	Hradek	NA
Do.	Zelezarny Veseli, a.s. (Z-Group Steel Holding)	Veseli nad Moravou	NA
Do.	Zelezarny Chomutov s.p. (Z-Group Steel Holding)	Chomutov	NA
Do.	ZDB Group a.s.	Bohumin	40
Uranium, U content metric tons	DIAMO s.p.	Rozna I Mine at Dolni Rozinka	500 [e]

[e]Estimated. Do., do. Ditto. NA Not available.
[1]Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.

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THE MINERAL INDUSTRIES OF DENMARK, THE FAROE ISLANDS, AND GREENLAND

By Harold R. Newman

DENMARK

The mining, quarrying, and mineral processing sectors have not traditionally been a driving factor in Denmark's economy. Mineral resources were limited and composed mainly of industrial minerals and mineral fuels, including peat. Denmark's industrialized market economy depended on imported raw materials and foreign trade. Denmark lies directly in the path of European trade by way of the Baltic Sea, the North Sea, and the Skagerrak Strait. Denmark was a member of the European Union (EU) and advocated in 2010 for a liberal trade policy within the EU (U.S. Department of State, 2011).

Private ownership and exploitation of minerals were allowed under Danish law. The permitting procedures for mineral production were developed and administrated at the county level. Regulations concerning the mineral industry were comparable with those of other EU countries (Ministry of Foreign Affairs, 2010).

About two-thirds of Denmark's foreign trade was with EU countries. In 2009 (the latest year for which data were available), EU countries accounted for 71% of Denmark's external trade, and Norway, another 5%. Germany and Sweden were Denmark's leading trading partners. In 2008 and 2009, China was the fourth ranked supplier of goods to Denmark. The United States was Denmark's leading non-European trading partner in 2009 (Statistical Yearbook, 2010, p. 7).

In 2010, U.S. exports to Denmark totaled $2.1 billion and U.S. imports from Denmark totaled 6.0 billion. U.S. exports to Denmark included nonferrous metals (valued at $27.1 million), mineral supplies ($13.5 million), petroleum products ($11.5 million), drilling and oilfield equipment, ($6.1 million), and excavating machinery ($4.9 million), in order of value (U.S. Census Bureau, 2010a).

In 2010, U.S. imports from Denmark included, in order of value, finished metal shapes except steel (valued at $38.4 million), iron and steel manufactures ($30.5 million), fuel oil ($27.7 million), petroleum products ($14.7 million), and bauxite and aluminum ($3.7 million) (U.S. Census Bureau, 2010b).

Production

Denmark lacked economically exploitable reserves of metallic mineral resources; however, it does have reserves of nonmetallic materials, such as chalk; clays, including bentonite and kaolin; lime; peat; salt; and stone, including dimension stone and limestone. Denmark was the only commercial producer of moler, which is a natural mixture of diatomite and smectite clay and was an important ingredient of insulation bricks. The production of natural gas and petroleum from the Danish area of the North Sea was continuing. These mineral fuels were the most valuable mineral commodities domestically. Petroleum production was declining as reserves were being depleted. In 2010, petroleum production fell for the fifth year in a row, dropping from a level of about 125 million barrels (Mbbl) in 2006 to about 90 Mbbl in 2010 (table 1).

Structure of the Mineral Industry

The Danish mineral industry was mostly privately owned. Table 2 is a list of the country's major mineral industry facilities, their capacities, and their locations.

Commodity Review

Industrial Minerals

Cement.—Aalborg Portland A/S (a subsidiary of Cementir Holdings S.p.A. of Italy), was the main producer of grey and white cement in Denmark. Aalborg operated seven kilns at its plant in Rordal, which had a capacity of 2.7 million metric tons (Mt) of grey cement and 850,000 metric tons (t) of white cement. Aalborg was the world's leading manufacturer of white cement, which had a wide range of applications, ranging from the aesthetic uses to highway safety barriers (the cement's whiteness ensures high visibility both day and night) (Aalborg Portland A/S, 2010, p. 3).

Mineral Fuels and Other Sources of Energy

Denmark's petroleum production in 2010 was valued at 40.4 billion Danish kroners (DKK) (U.S. $6.9 billion[1]), and the value of natural gas production was DKK10.6 billion ($1.8 billion) of the total production value (Danish Energy Agency, 2010).

All of Denmark's producing natural gas and petroleum fields are located in the Danish area of the North Sea. In 2010, Denmark had 19 producing fields of various sizes. Production in 2010 came from 283 production wells. Denmark had two refineries—one in Kalundborg and the other in Frederica; the refineries had a total crude distillation capacity of 172,000 barrels per day (bbl/d). The Kalundborg refinery processed primarily Norwegian crude but could process condensates and other crudes as well. The Frederica refinery processed mostly Danish North Sea crude oil that was supplied by pipeline from Danish offshore production. Denmark had been a net exporter of crude oil since the mid-1990s and was expected to remain a net exporter through 2018 (International Energy Agency, 2011).

[1]Where necessary, values have been converted from Danish kroners (DKK) to U.S. dollars (US$) at an average rate of DKK5.84=US$1.00 for 2010.

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Geothermal Energy.—A survey by the Geological Survey of Denmark revealed significant supplies of geothermal resources in porous sandstone layers beneath the surface. These resources are related mainly to the Mesozoic succession of the Danish basin and the Fennoscandian Border Zone. This succession is known from about 60 deep wells drilled either for hydrocarbons, geothermal energy, or natural gas storage. Denmark's geothermal plant located at Thisted in northwestern Denmark produced heat from water that was heated to a temperature of 44 °C (111°F) by geothermal processes and pumped from the Upper Triassic Gassum sandstone aquifer at about 1 kilometer (km) depth. The wide distribution of such underground reservoirs made it possible for many of the existing district heating networks to make use of geothermal heat with a high efficiency (Geological Survey of Denmark, 2010).

Outlook

Further exploration of natural gas and petroleum reserves will likely continue in an effort to offset the country's declining production. Continued research in new technology and the testing of new exploration methods are expected to play a major role in Denmark's future natural gas and petroleum production. Denmark is likely to continue to be a net exporter of mineral fuels into the near future. The Government is also likely to continue to consider the introduction of a long-term target, by the year 2050, of becoming fully independent of fossil fuels—a policy which would further encourage greater energy efficiency and growth in renewable energy production.

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FAROE ISLANDS

The Faroe Islands, which is a self-governing overseas administrative division of Denmark, had no identified mineral resources. The Faroese economy depended on fishing and salmon farming and was aided by a substantial annual subsidy from Denmark. The principal involvement of the Faroe Islands in the international mineral industry was as a market for imported materials, principally cement, fertilizer materials, and fuels.

Possible future discoveries of oil in the Faroese area could make eventual oil production possible along with diversification of the economy. In 2010, the Faroe Islands had the first licensing activity since 2008. Two Faroese companies, Atlantic Petroleum P/F and Faroe Petroleum plc were exploring in the offshore license area 015. The Kùlubokan license (016) was awarded to Statoil ASA (50%) of Norway, DONG Energy of Denmark (30%), and Atlantic Petroleum and Faroe Petroleum (20% combined); the Rannva extension was awarded to Faroe Petroleum (World Oil, 2011).

A group led by the operator Eni Denmark BV spudded in an exploratory well on the Anne Marie prospect off the Faroe Islands on the Atlantic margin. The Seadrill West Phoenix semisubmersible rig was drilling the 6004/8a-1 commitment well in 1,106 meters (m) of water 190 km southeast of Torshavn. It targeted a petroleum prospect in a structural trap of Eocene and Paleocene age (Faroe Islands Review, 2010).

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GREENLAND

Previously, about one-half of Greenland's revenues came from grants from the Danish Government. This changed when greater independence passed over to the Greenlanders on their national day in 2009. On January 1, 2010, the Inatsisartut (Mineral Resource) Act No. 7 on mineral resources and related activities came into force. The Mineral Resource Act replaced the Consolidation Act No. 368 of June 18, 1998, on mineral resources in Greenland. The Mineral Resource Act establishes the foundation and the framework for future control of mineral resources, including the activities that affect the development of the mineral resources. The Act states that such activities must be performed in accordance with best international practices and must be executed solely with the permission of the Naalakkersuisut (Government of Greenland). Under self rule, which took effect in 2009, Greenland gained specific legal rights and benefits, which included the right to control Greenland's minerals and potential natural gas and petroleum fields (Mining Journal, 2010).

The Catlin Arctic Survey projected that within a decade the Arctic Ocean would be an "open sea" almost entirely free of ice. Ice cover during the northern summer months would have entirely disappeared within 20 years, but most of the decrease would happen before 2020. Mineral resource companies have been among the first to view this as a commercial opportunity. Greenland was also attractive because, despite the high cost of operating in such extreme conditions, it was politically stable (Perth Now, 2010).

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Commodity Review

Metals

Gold.—At yearend 2010, Angel Mining plc of the United Kingdom announced that it had begun introducing ore into the process plant at its Nalunaq Mine. When the mine reaches full production in 2012, the Nalunaq Mine was expected to produce about 710 kilograms per year of gold. Angel Mining was planning to minimize transport and refining costs by shipping dore once an optimal quantity had been produced. The first shipment of dore was expected to take place in 2011 (Balashov, 2010).

Nuukfjord Gold Mining Ltd. of Canada announced that it had commenced a drilling and exploration program at its Nuukfjord project. The project included a 20-drill-hole, 4,000-to-5,000-m diamond drill program at the Storo gold deposit. The Storo deposit extended for about 800 m and was open for expansion along strike and down dip. The drilling at Storo would target the thrust zone and test the northward down dip extension of the gold-bearing Main zone. Subsequent drill holes would focus on the deposit's parallel Main and BD zones. Surface prospecting and detailed geologic mapping would be carried out within the Storo and Storo North mineralized trend, which was a 4-km-long gold prospective area, with the goal of defining additional drill targets. Also, Nuukfjord Gold was conducting regional-scale exploration on other areas within the Igasoq, the Isua, and the Qussuk areas, and was targeting numerous showings and geochemical anomalies (Nuukfjord Gold Mining Ltd., 2010).

Lead and Zinc.—Angel Mining was continuing with its exploration and development program to reopen the Black Angel Mine. Contractors had been selected for the development of the mineral processing and waste handling plants as well as the reopening of the Black Angel Mine. Angel Mining was undertaking extensive exploration of its 259-square-kilometer (km^2) license area aimed at the discovery of other lead-zinc deposits thought to be present in the area (International Mining, 2010).

Ironbark Zinc Ltd. of Australia continued its 2010 drilling program that was focused on the development of its base-metals operation. Ironbark Zinc estimated that its Citronen project might host a possible 4.5 billion metric tons of lead and zinc ore. The Joint Ore Reserve Committee (JORC)-compliant resource was calculated as having an estimated indicated resource of 30 Mt grading 0.6% lead and 5.8% zinc, and an estimated inferred resource of 26 Mt grading 0.7% lead and 5% zinc (Ironbark Zinc Ltd., 2010).

Industrial Minerals

Diamond.—In early 2010, NunaMinerals conducted a 2,131-km-long magnetic survey within the Qaamasoq license and a 3,955-km-long magnetic survey within the Tikiusaaq license. These surveys defined new exploration targets for diamond. Further field work revealed a kimberlite float at Qaamasoq and kimberlite dykes at Tikiusaaq. A macle diamond, which is a trigon or triangular diamond crystal, was recovered from the kimberlite float at Qaamasoq. At Tikiusaaq, a micro diamond was recovered from a kimberlite dyke. This was the first discovery of a diamond in the Nuuk region. The dyke was exposed for an area of about 500 m and was traced by ground magnetics for an additional length of about 1 km (NunaMinerals A/S, 2010a).

Gemstones.—True North Gems Inc. announced that the field-related components of the advanced exploration and engineering program had been completed in 2010 at the company's 823-km^2 Fiskenaesset ruby project, which is located on the southwestern coast of Greenland. The prefeasibility study and environmental impact study were completed in 2010. An indicated resource was estimated to be 296 million carats, and an additional inferred resource was estimated to be 109 million carats. In a 30-t sample, individual rubies valued at $3,220 per carat and individual pink sapphires valued at up to $460 per carat were recovered. True North stated that mining could begin as soon as 2013 (True North Gems Inc., 2010).

Olivine.—Minelco A/S of Sweden announced that it was closing its Seqi Mine at Fiskefjord, west Greenland, at yearend 2010. Seqi's closure would remove about 25% of the world's olivine capacity from the marketplace. The Seqi Mine was Minelco's sole olivine producer and ranked second in the world after Norway's North Cape Minerals A/S (Industrial Minerals, 2010).

Rare Earths.—Greenland Minerals and Energy Ltd. (GMEL) of Australia reported that it had access to what could possibly be the world's largest rare-earth elements (REE) deposit, second only to deposits in China. The Kvanefjeld multi-element project was estimated to have the potential to supply about 25% of the world's requirement for REE. Kvanefjeld was an unusual deposit in that it was enriched with REE, uranium, and zinc. GMEL's permit was issued in accordance with an amendment to the standard terms for exploration licenses that created a framework for the evaluation of mineral deposits that contained uranium. Previously, Greenland had a zero-tolerance approach to uranium mining owing to environmental concerns. GMEL, which was planning to complete its prefeasibility study in 2011 before commencing a final feasibility study, was awaiting final results from the 2010 exploration program (Greenland Minerals and Energy Ltd., 2010).

Hudson Resources Inc. of Canada announced the results from its phase 1 drill program at the Sarfartoq REE project. Drilling in the ST1 zone intercepted wide zones of high-grade REE mineralization. Phase 2 drilling was scheduled to commence at yearend 2010 and would include about 2,000 m of diamond drilling on existing and new targets. The additional drilling was required to better define larger zones of higher mineralization, as it was a complex system. GeoSim Services Inc. of the United States was to complete an independent National Instrument (NI) 43–101-compliant resource estimate of the ST1 zone when the phase 2 exploration is complete (Hudson Resources Inc., 2010).

The Greenland mining company NunaMinerals A/S announced that magnetic and radiometric surveys showed potential for REE in its Qeqertaasaq and Tikiusaaq license areas. At Qeqertaasaq, exploration was focused on locating, sampling, and mapping potential REE-enriched carbonatite dykes in the core of the carbonatite complex. The average

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grade of 157 samples taken from a 1.5-km^2 area of interest was reported to be 2.4% total rare-earth oxides with a low uranium content. Initial mineralogical testing indicated that the main REE mineral at Qeqertaasaq was a coarse-grained ancylite, which was a relatively easily dissolved REE carbonate. Further metallurgical work was planned on bulk samples (NunaMinerals A/S, 2010b).

At Tikiusaaq, further interpretation of geophysical survey magnetic data raised the prospectively of the area for REE and indicated that the carbonatite dykes continued to a depth of about 500 m. A thorium anomaly, within which all the REE-enriched float samples were located, indicated a separate body about 750 m long and about 100 m wide. The magnetic data also indicated that the carbonatite, which has a twin core structure, could be larger and more complex than previously thought. NunaMinerals expected to carry out further prospecting activities in 2011, including trenching of the target zone to prepare the project for the initial drilling stage (NunaMinerals A/S, 2010c).

Mineral Fuels and Related Materials

Natural Gas and Petroleum.—In the Arctic, natural gas and petroleum companies faced high costs, high risks, and lengthy lead times for development. The Arctic resource base is largely composed of natural gas and natural gas liquids, which are significantly more expensive to transport over long distances than petroleum. Also, protecting the environment would be costly. Additional costs might be imposed on future development if a warming of the Arctic region melts the permafrost and turns existing soils into bogs and marshes. Ironically, warmer Arctic temperatures would shrink the ice pack, making it easier and less costly to drill (Rigzone.com, 2010).

The Government awarded seven licenses for exploration and exploitation of natural gas and petroleum in the Greenland part of the Baffin Bay to the following companies: A.P. Maersk Oil AP and DONG Energy ASA of Denmark, GDF Suez S.A. of France, NunaOil A/S of Greenland, Royal Dutch Shell plc of the Netherlands, Statoil ASA of Norway, Cairn Energy plc. of the United Kingdom, and ConocoPhillips Corp. of the United States. The Government had received 17 block applications from 12 international companies. All together, the blocks granted in 2010 cover an area of 70,768 km^2, and the total area under natural gas and petroleum license was 200,000 km^2 (OilVoice, 2010).

Uranium.—The Government amended its standard terms for exploration licenses and has ceased a decades-old ban on uranium exploration to allow for the inclusion of radioactive elements as exploitable minerals for the purpose of evaluating and reporting. This amendment would allow Greenland Mineral's Kvanefjeld and Ram Resources Ltd. of Australia's Motzfeldt projects to proceed to development. Both the projects host thorium and uranium at above-ground levels within the mineralized zone (Swanepol, 2010).

Outlook

Greenland has abundant mineral and natural resources. The global warming trend is expected to continue, opening more area for exploration. New mineral deposits are likely to be discovered as exploration accelerates. Finding hydrocarbons will continue to be very important for Greenland. The political status and the Government's encouragement of mineral resource development is expected to continue to accelerate mineral development.

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TABLE 1

DENMARK: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1,2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
Aluminum metal, secondary		25,000	30,000	25,000	25,000	25,000
Cement, hydraulic		5,499 [r,3]	21,209 [r,3]	16,092 [r,3]	15,780 [r,3]	16,000
Chalk, calcium carbonate	thousand cubic meters	1,900	1,950	2,000	2,735 [r,3]	2,600
Clays:[4]						
Bentonite		19,211 [3]	20,093 [3]	22,458 [3]	20,000	20,000
Other		5,000	5,000	5,000	5,000	5,000
Moler, extracted	thousand cubic meters	240	241 [3]	252 [3]	202 [r]	225
Gas:						
Manufactured	million cubic meters	1,500	1,500	1,500	1,500	1,500
Natural	do.	10,304 [3]	9,128 [3]	9,564 [3]	9,600	8,438 [3]
Gold[5]	kilograms	1,500	1,639 [3]	1,518 [3]	1,600	1,600
Lime, hydrated and quicklime		115,000	115,000	115,000	115,000	115,000
Natural gas plant liquids	thousand 42-gallon barrels	48,000	48,000	50,000	53,000	53,000
Nitrogen, N content of ammonia		1,600	1,600	1,600	1,600	1,600
Olivine	thousand metric tons	1,000	1,100	1,100	1,100	1,100
Peat	thousand cubic meters	298,000	242,000	145,000	145,000	145,000
Petroleum:						
Crude[3]	thousand 42-gallon barrels	124,830	113,734	104,573	97,455	90,338
Refinery products:						
Liquefied petroleum gas	do.	1,898 [3]	1,862 [3]	1,314 [3]	1,300	1,300
Gasoline	do.	16,863 [3]	16,608 [3]	16,352 [3]	16,000	16,000
Naphtha	do.	50	50	50	50	50
Jet fuel	do.	4,818 [3]	4,271 [3]	3,942 [3]	3,900	3,900
Distillate fuel oil	do.	24,601 [3]	24,054 [3]	23,068 [3]	23,000	23,000
Refinery gas	do.	1,800	1,800	1,800	1,800	1,800
Residual fuel oil	do.	9,478 [3]	9,125 [3]	8,870 [3]	8,800	8,800
Total	do.	59,500	57,800	55,400	54,900	54,900
Salt, all forms		600,000	600,000	600,000	600,000	600,000
Sand and gravel[3]	thousand metric tons	72,508	68,255	59,937	46,932	46,932
Stone, crushed	do.	372 [3]	410 [3]	384 [3]	312	360
Sulfur, recovered		4,142 [3]	3,896 [3]	3,467 [3]	3,800	3,800

[r]Revised. do. Ditto.

[1]Estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through December 31, 2011.

[3]Reported figure.

[4]Denmark was believed to produce kaolin, but data on production were not available.

[5]Production from Greenland.

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TABLE 2
DENMARK: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement:				
Grey cement		Aalborg Portland A/S (Cementir Holding S.p.A.)	Plant at Rordal	2,700
White cement		do.	do.	850
Chalk, (calcium carbonate)		A/S Faxe Kalkbrud	Quarries at Stevns and Sigerslev	250
Diatomite (moler)	thousand cubic meters	Dansk Moler Industri A/S (Damolin)	Quarries on Mors and Fur Islands	145
Kaolin		Aalborg Portland A/S	Mine and plant on Bornholm Island	25
Lime		A/S Faxe Kalkbrud (Aalborg Portland Holding A/S)	Plant at Stubberup, near Fakse, on Zealand Island	200
Natural gas	million cubic meters	Maersk Olie og Gas A/S	Roar and Tyra Gasfields, Danish North Sea	2,550
Olivine		Minelco A/S	Seqi Mine, Fiskefjord (closed 2010)	2,000
Petroleum:				
Crude	barrels per day	Dansk Underground Consortium	Dan, Gorm, Rolf, and Tyra, Danish North Sea	127,000
Refined	do.	Statoil A/S	Kalundborg	102,000
Do.	do.	A/S Dansk Shell	Fredericia	70,000
Salt		Dansk Salt I/S	Mine (brine) at Hvornum, plant at Mariager	600

Do., do. Ditto.

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The Mineral Industry of Estonia

By Mark Brininstool

As the country's economy began to recover from the effects of the world financial crisis, in 2010, Estonia's gross domestic product (GDP) increased by 3.1% after decreasing by 13.9% in 2009 and by 5.1% in 2008. Mining and quarrying activities accounted for only about 1.2% of the total GDP. Estonia was not rich in natural resources, but the country had one of the world's few rare-earth metals processing plants located outside of China and was one of the few countries in the world that produced oil shale (Statistics Estonia, 2011, p. 29–30, 195).

Silmet AS began production of rare-earth metals in 1970 and had the capacity to produce up to 3,000 metric tons per year (t/yr) of rare-earth products and 700 t/yr of rare-metal products. The company produced cerium, lanthanum, neodymium, praseodymium, and samarium-europium-gadolinium products as well as niobium and tantalum metal chips, ingots, metallic hydrides, and powders. In April 2011, Molycorp Minerals LLC (a subsidiary of Molycorp, Inc.) purchased a 90.023% share of Silmet AS for about $89 million (Molycorp, Inc., 2011; Silmet AS, 2012a–d).

Oil shale production decreased in 2008 and 2009 owing to reduced demand for electricity, but production increased by about 20% in 2010 compared with that of 2009 as electricity generation increased. The use of oil shale provided Estonia with a relatively high degree of energy security for the region. In 2010, about 88% of the oil shale produced in Estonia was used for electricity and heat generation, and 90% of the electricity generated in Estonia was from oil shale. Esti Energia AS produced about 94% of Estonia's oil shale. A significant amount of carbon dioxide was produced when oil shale was used to produce heat and electricity, and Estonian law restricted mining of oil shale to 20 million metric tons per year (Mt/yr). One of the objectives the National Development Plan for Oil Shale Use in Estonia for 2008–2015 was to reduce oil shale production to 15 Mt/yr by 2015, so future production of oil shale could be limited by environmental concerns (Eesti Energia AS, 2011, p. 6, 48; Statistics Estonia, 2011, p. 318).

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TABLE 1

ESTONIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
Cement:						
Clinker (sold production)		65,100	302,700	324,000	314,000	209,000
Portland, other		848,900	937,400	808,000	326,200	375,000
Clays:						
For brick	cubic meters	231,400	214,000 e	138,106	70,000	70,000 e
For cement	do.	56,700	51,900 e	33,494	15,000	15,000 e
Coal, lignite e		-- r	-- r	-- r	-- r	--
Coke, electrode		32,659	39,916	35,380	29,900 r	22,400
Crushed stone used for concrete aggregates, for roadstone, and for other construction use		8,298,400	8,855,800	7,891,000	5,400,300	5,500,000 e
Dolomite:						
For building	cubic meters	378,300	356,000 e	329,634	200,000	200,000 e
For finishing	do.	1,660	2,720 e	2,519	1,000	1,000 e
For industry (technological limestone)	do.	128,540	210,000 e	194,447	100,000	100,000 e
Fuel oil		389,200	436,600	444,800	489,300	530,000 e
Gravel, pebbles, shingle and flint	cubic meters	410,300	1,229,900	717,000	400,000	400,000 e
Lead, metal, secondary		9,000	10,000	10,000	9,176 r	10,718
Lime		39,700	43,500	59,400	24,100 r	27,200
Limestone:						
For building	cubic meters	2,343,800	2,750,000 e	2,627,741	1,200,000	1,200,000 e
For cement	do.	340,300	480,000 e	458,661	200,000	200,000 e
For industry (technological limestone)	do.	87,600	126,000 e	120,398	80,000	80,000 e
Niobium, metal, chips		NA	NA	NA	NA	NA
Nitrogen, N content of ammonia		73,158	66,746	78,912	50,000	50,000 e
Oil shale	thousand metric tons	14,004	16,393	16,117	14,939 r	17,934
Peat, all uses[3]		1,206,800	964,000	732,700	859,700	965,000
Of which:						
For fuel		506,800	475,000	213,400	328,000	360,800
Briquets		100,600	128,400	67,500	45,300	45,000 e
Rare-earth metals e		3,000	3,000	3,000	3,000	3,000
Sand and gravel	cubic meters	4,214,200	5,275,900	4,750,800	3,000,000	3,000,000 e
Silica sand (technological sand)	do.	--	--	--	--	36,000
Sulfuric acid	kilograms	5	NA	NA	--	--
Tantalum, metal, chips		NA	NA	NA	46 r	36

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through February 6, 2012.

[2]In addition to the commodities listed, Estonia produces sulfur, but available information is inadequate to make reliable estimates of output.

[3]It can be assumed that the portion of total peat production not used as fuel is used in agricultural applications, although this is not specified.

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THE MINERAL INDUSTRY OF FINLAND

By Harold R. Newman

Finland, which was a member country of the European Union (EU), has a long tradition of mining activity, and Finnish metallurgical technology and manufacturing of mining equipment was well known throughout the international mining community. Finland's location in the middle of the Fennoscandian Shield gives it excellent potential for the occurrence of a variety of minerals. Exploitation of metallic minerals, including chromite, cobalt, copper, nickel, and zinc, and of industrial minerals, including apatite, carbonates, and talc, provided a base for the country's mineral industry (United Nations, 2010).

The revised Mining Act, which became effective on July 1, 2011, promotes mining but also takes into account environmental issues and the rights of citizens, landowners, and municipalities to influence decisionmaking. Under the revised Mining Act, the right to exploit a deposit is based on a mining permit and the review of permits is more comprehensive than under the original Mining Act. The mining operator's termination and after-care obligations are also more extensive, and the mining operator is required to provide a security deposit for the purpose of fulfilling after-care obligations. The Finnish Safety and Chemical Agency is the new mining authority under the revised Mining Act (Ministry of Employment and the Economy, 2011).

Minerals in the National Economy

The mineral industry was very important to the country's economy and played an increased role in 2010, both domestically and internationally. The Government offered the mineral industry a favorable investment and operating environment. Finland is located close to major markets and had processing facilities for several minerals. Also, new mineral discoveries were likely as many deposits had not yet been aggressively explored as of yearend 2010 (Altona Mining Ltd., 2010).

Finland's diverse mineral resources represented a significant part of the Finnish national wealth and were expected to continue to be economically significant in the future. In 2010, the Government published a new strategy that included proposals for developing the mineral sector, including increased emphasis on the mineral sector, securing the supply of raw materials, reducing the environmental impact of the mineral sector, increasing the mineral industry's productivity, and strengthening the sector's research and development capabilities and expertise (Invest in Finland, 2010a).

The volume of mineral commodity sales in 2010 nearly doubled compared with that of 2009. In 2010, gross sales reached about €808 million (about $1 billion[1]) compared with the 2009 gross sales of about €481 million (about $613 million). The value of ongoing mining investment for 2010–12 was expected to be more than €960 million (about $1.2 billion). The area of valid mining claims quadrupled from September 2009 to September 2010, which was the latest period for which data were available (Invest in Finland, 2010b).

Production

Activities of the mineral industry of Finland in 2010 were concentrated on the production of base metals, gold, industrial minerals, and platinum-group metals (PGMs). The production of mineral commodities continued to be significant in terms of volume and contribution to the country's economy. Finland was the leading talc producer in Europe and the fifth ranked talc producer in the world (Virta, 2011). Data on mineral production are in table 1.

Structure of the Mineral Industry

Finland's mineral resource companies were mostly privately owned. The Government held an equity position in some of the major mineral commodity producers, such as Kemira Oyj, Outokumpu Oyj, and Rautaruukki Oy. The mineral industry operated on a free market basis. The companies' major facilities and their annual capacities are listed in table 2.

Commodity Review

Metals

Chromium.—Outokumpu reported that the estimated mineral resources at its Kemi Mine were significantly greater than that estimated previously. Previous estimates had indicated that, at 2010 mining volumes, the mineral resources would last for about 70 years. Based on 2010 information, the mineral resources were projected to last for more than 100 years, even if the annual mining production rate is doubled. The Kemi Mine was the only chromite mine in the EU; it was discovered in 1959, and production started in 1968. The Kemi Mine produced chromite concentrates that were used in Outokumpu's ferrochrome smelter at Tornio. The chromite ore graded an average of 28.6% chromium oxide (Cr_2O_3) and consisted of a chromite ore layer that was about a 2.5 kilometers (km) deep (Good News from Finland, 2010).

Copper.—Boliden Harjavalta AB's complex consisted of two plants—the copper smelter in Harjavalta, which produced copper anodes, and the copper refinery at Pori, where copper anodes were refined into copper cathodes. The smelter had the capacity to produce 210,000 metric tons per year (t/yr) of copper, which was cast into copper anodes. Sulfur was recovered as a byproduct. The copper anodes were then shipped to the Pori refinery where the anodes were refined into copper cathodes. The capacity of the refinery was 155,000 t/yr. The

[1]Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at an average rate of €1.00=US$1.27.

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refinery also produced gold and silver as byproducts (Boliden Harjavalta AB, 2010).

Gold.—Dragon Mining Ltd. of Australia's Orivesi Mine is located 80 km northeast of the Vammala Production Center within the Tampere Schist Belt. Two vertical pipe-like lode systems, Kutema and Sarvisuo, occur in strongly deformed, andalusite-rich, silicified zones. Two diamond drilling programs were completed above and adjacent to the Sarvisuo lode. A 10-hole drilling campaign provided evidence of the existence of a new mineralized pipe or pipe clusters. The intercepts confirmed that the Sarvisuo system could extend at widths and grades that were potentially amenable to underground mining. Further drilling would be required to better define the extent and geometry of the identified mineralization prior to mining (Dragon Mining Ltd., 2011).

Dragon Mining was engaged in other gold exploration, development, and mining projects, which included the Jokisivu Mine. At yearend, construction of the decline for underground development was initiated at the Kujankallio deposit at Jokisivu. The decline, which would provide mine access, was located at the eastern end of the Kujankallio Mine's open pit. In 2010, an infill drilling program was underway at Kujankallio to improve the categories of resources and to allow for more detailed mine planning. Exploration and further internal studies were underway to determine the viability of a development that would encompass the Arpola deposit, which was located 200 meters (m) to the east (Dragon Mining Ltd., 2010).

Nickel.—Belvedere Resources Ltd. of Canada announced the restart of its Hitura Mine. Nickel concentrate was produced ahead of the scheduled restart of the mine, and the mill and mine were ramping up to full production in 2011. The full production rate of about 45,000 metric tons per month of ore was scheduled to be achieved in 2011. The operation was scheduled to produce about 2,100 t/yr of nickel in concentrate starting in 2011 (Belvedere Resources Ltd., 2010).

Talvivaara Mining Co. plc's nickel project, which was the world's first bioheapleach project for nickel, was centered on two polymetallic deposits—the Kolmisoppi and the Kuusilampi; the deposits were located about 30 km southwest of Sotkamo, in eastern Finland. The deposits form one of the largest known nickel sulfide resources in Europe. The Talvivaara ore bodies are located within the Kainuu Schist Zone, which is a north-south-trending schist belt that extends from Rautavaara in the south to Pudasjarva in the north, and consists of a series of metasediments of greenschist to upper amphibolite facies belonging to the Karelia Supergroup. The open pit mine was also expected to produce cobalt, copper, and zinc as byproducts (Talvivaara Mining Co. plc, 2010).

Platinum-Group Metals.—Most of Finland's known deposits of platinum-group metals (PGM) are located in the northern part of the country in a belt crossing east of Tornio to Narankavaara. Another belt containing layered intrusions runs from northwestern Finland, southeast through Lapland by way of Akanvaara, and on into Russia. Forty-three areas that could possibly contain undiscovered deposits of PGMs have been identified in Finland (Invest in Finland, 2010c).

Industrial Minerals

Rare Earths.—Tasman Metals Ltd. of Canada's Korsnäs project was a rare-earth element (REE) zone with enrichment of cerium, lanthanum, and neodymium, which made up 80% to 90% of the deposit. The balance consisted mainly of praseodymium and samarium. The project was mined by Outokumpu as a mixed open pit and underground operation from 1959 to 1972. REE mineralization occurs within a north-south-trending skarn zone, which is composed of apatite, barite, coarse-grained calcite, diopside, feldspar, and galena. The drill-defined and mined ore body was about 20-m thick, trended across a strike length of more than 300 m, and extended from the surface to a vertical depth of 175 m. The extent of the mineralization continued along strike and at a depth that was unknown at yearend 2010 (Tasman Metals Ltd., 2010).

Wollastonite.—Nordkalk Corp., which was the only European producer of wollastonite in 2010, announced that it had launched a new generation of high-aspect-ratio wollastonite fillers. The name of the new product was Norwoll wollastonite, and it was designed for thermoplastic and thermoset applications. Wollastonite ($CaSiO_3$) is a calcium metasilicate with the theoretical composition of 48.3% calcium oxide and 51.7% silicon dioxide; it is used mainly in the production of abrasive material, ceramics, coatings, elastomers, metallurgy, and plastics (Nordkalk Corp., 2010).

Mineral Fuels and Related Materials

Natural Gas and Petroleum.—Royal Dutch Shell plc of the Netherlands announced that it was selling the majority of its refining and marketing business in Finland to Keele Oy. The businesses included 225 service stations as well as the bulk fuels and the commercial road transport businesses. Not included were the aviation and liquefied petroleum gas businesses. Shell announced that the transaction was consistent with its strategy to reduce its refining capacity by 15% and to reduce its marketing footprint (Royal Dutch Shell plc, 2010).

Uranium.—Mawson Resources Ltd. of Canada announced a National Instrument (NI) 43–101 estimated inferred mineral resource of 2 Mt of uranium ore with an average grade of 0.074% uranium oxide (U_3O_8) at its Nuottijarvi uranium deposit in central Finland, which was one of the country's largest known uranium deposits. The mineralized body is about 40-m thick, extends from the surface to a vertical depth of 80 m, trends across a strike length of more than 400 m, and remains open along strike and at depth. The U_3O_8 occurs as uraninite associated with fluorapatite within a 40-m-wide mineralized breccia hosted by a carbonate-apatite horizon at the contact between quartzite and graphite-bearing phyllite (Mawson Resources Ltd., 2010).

Talvivaara Mining considered modifying its nickel extraction process at its nickel mine near Sotkamo in order to recover uranium as a byproduct. Talvivaara Mining reported that during the bioheapleaching recovery, small concentrations of uranium leached into the process solution. Talvivaara was investigating the potential to modify its production process so that the uranium contained in the solution could be utilized as

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uranium oxide (yellow cake). The cost to modify the extraction process was estimated to be €30 million ($38.1 million) with a production cost of about €2 million ($2.5 million) per year. Uranium output would be about 350 t/yr and could make the country almost self-sufficient with respect to uranium. Finland did not produce any uranium in 2010 and imported all its nuclear fuel requirements for its four operating nuclear power reactors (World Nuclear News, 2010).

Outlook

Finland has a long mining history and a traditional focus on primary resources, which is expected to continue. Exploration, particularly for gold, is expected to continue at a strong pace. The operating environment for mining companies in Finland is generally favorable for exploration and mining and is expected to remain so. The country's mining laws and legislation will continue to encourage exploration and development. In addition, the country has a well-developed infrastructure that will continue to benefit exploration and exploitation activities. There is a significant potential for the occurrence of various mineral commodities as the Geological Survey of Finland continues to identify metallic and industrial mineral deposits and compile geoscience data.

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TABLE 1

FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum, metal, secondary	metric tons	35,773	44,223	24,706	17,885 [r]	18,000
Chromite:						
Cr_2O_3 content		549	556	614	247	250
Of which:						
Lump ore		80	80	85	80	80
Foundry sand		5	5	5	5	5
Total		85	85	90	85	85
Cobalt, refined	metric tons	5,903	5,862	6,301	4,665	9,413 [3]
Copper:						
Concentrate, gross weight	do.	44,663	47,798	47,077	49,730	50,000
Mine output, Cu content	do.	13,000	13,600	13,000 [e]	14,600 [r]	14,700
Metal:						
Smelter	do.	192,235	149,206	174,354	139,710	151,000
Refined	do.	136,674	109,837	137,953	105,549	121,600 [3]
Gold, metal, mine output	kilograms	5,292	4,621 [r]	4,148 [r]	1,785	1,800
Iron and steel, metal:						
Pig iron	metric tons	3,158	2,915	2,943 [r]	2,042 [r]	2,400
Ferroalloys, ferrochromium		243	242	234	123	125
Steel, crude		5,052	4,431	4,418	3,078	4,023 [3]
Mercury	kilograms	22,879	45,195	33,120	6,210	6,000
Nickel:						
Mine output, Ni content	metric tons	2,985	3,465	4,303	4,400 [e]	4,400
Metal, electrolytic	do.	47,469	54,964	51,936 [r]	40,800 [r]	41,000
Platinum	kilograms	711	461	214	265	275
Selenium, metal	do.	70,458	52,459	58,069	66,028	65,000
Silver, metal	do.	38,428	33,447	59,375	60,019	60,000
Zinc:						
Mine output, Zn content	metric tons	66,109	72,118	51,900	56,415	55,562 [3]
Metal	do.	282,238	305,543	297,722	295,049	300,000
INDUSTRIAL MINERALS						
Cement, hydraulic		1,685	1,743	1,633	1,052	1,200
Feldspar	metric tons	43,187	48,890	45,250	45,000	45,000
Lime		502	517	482	410	425
Mica	metric tons					
Concentrate		8,097	11,449	10,706	10,000 [e]	10,000
Biotite		63	58	57	60 [r]	60
Nitrogen, N content of ammonia	metric tons	91,356	100,623	73,868	68,379	70,000
Phosphate rock apatite concentrate:[e]						
Gross weight		858 [3]	860	780	660 [3]	700
P_2O_5 content		325 [3]	325	NA	234	265
Pyrite, gross weight		495	509	510 [3]	679 [3]	650
Sodium sulfate		27	20	22	NA	NA
Stone, crushed:						
Limestone and dolomite:						
For cement manufacture		1,569	1,764	1,807	1,800 [e]	1,800
For agriculture		657	547	647	640 [e]	640
For lime manufacture		328	310	317	325 [e]	325
Fine powders		625 [e]	625	650	650 [e]	650
Metallurgical[e]		1	1	1	1	1
Total		3,161	3,247	3,422	3,420 [e]	3,420
Quartz silica sand		3,003	2,958	3,160	2,241	2,400

See footnotes at end of table.

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TABLE 1—Continued

FINLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
INDUSTRIAL MINERALS—Continued						
Sulfur:						
S content of pyrite[e]		326	326	226	154	150
Byproduct:[e]						
Metallurgy		326 [r]	331 [r]	331 [r]	274 [r]	275
Petroleum		70	125 [r]	117 [r]	127 [r]	125
Total		396 [r]	456 [r]	448 [r]	401 [r]	400
Sulfuric acid		971	904	956	851	850
Talc		559	536	528	500 [e]	500
Wollastonite	metric tons	16,200	16,364	15,600 [e]	16,000 [e]	16,000
MINERAL FUELS AND RELATED MATERIALS						
Peat:						
For fuel use		6,919	8,671	6,933 [r]	5,576	4,032 [3]
For agriculture and other uses		896	1,145	1,552 [r]	876	768
Petroleum refinery products	thousand 42-gallon barrels	79,835	89,130	95,325	95,000	95,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. Do. Ditto. NA Not available.

[1]Table includes data available through December 31, 2011.

[2]In addition to the commodities listed, granite and soapstone were produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

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TABLE 2
FINLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Ammonia		Kemira Oyj (Government, 98%)	Plant at Oulu	75
Apatite		Kemira Agro Oyj (Government, 98%)	Mine and plant at Siilinjarvi	8,000
Cadmium, metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	1
Cement		Finncement Oy (Irish Cement Ltd., 100%)	Plants at Lappeenranta and Parainen	1,020
Chromite		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Kemi	1,000
Cobalt		Norilsk Nickel Harjavalta (OJSC MMC Norilsk Nickel, 100%)	Plant at Kokkola	NA
Copper:				
Ore, Cu content		Inmet Mining Corp.	Mines at Pyhasalmi, Saattopora, and Hitura	10
Metal		Boliden Harjavalta AB (Boliden AB, 100%)	Smelter at Harjavalta	210
Do.		do.	Refinery at Pori	155
Feldspar		SP Minerals Oy (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mine and plant at Kemio	50
Ferrochrome		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Tornio	250
Gold:				
Ore, Au content	metric tons	Dragon Mining Ltd.	Mine at Orivesi	4
Do.	do.	Scanmining Corp.	Pahtavaara Mine near Sodankyla	2
Metal	do.	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Pori	4
Limestone		Nordkalk Corp. (Rettig Group, 100%)	Mines at Lappeenranta, Pargas, and Parainen	1,500
Do.		Rauma-Repola Oy	Mine at Tornio	300
Mercury	metric tons	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	150
Mica		Kemira Oyj (Government, 98%)	Mine at Siilinjarvi	10
Nickel:				
Ore, Ni content		Belvedere Resources Ltd.	Mine at Hitura	3
Metal		Norilsk Nickel Finland (OJSC MMC Norilsk Nickel, 100%)	Smelter at Harjavalta	32
Do.		do.	Refinery at Harjavalta	50
Petroleum products	thousand barrels per day	Neste Oil Oyj, 50%, and Government, 50%	Plants at Naantali and Porvoo	NA
Phosphate-apatite		Kemira Oyj (Government, 98%)	Mine at Siilinjarvi	700
Do.		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Mine at Pyhasalmi	800
Quartz and quartzite		SP Minerals Oy (Partek Corp., 50.1%, and SCR-Silbeco SA, 49.9%)	Mines at Kemio and Nilsia	250
Selenium	metric tons	Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Pori	35
Silver	do.	do.	do.	30
Steel:				
Crude		Rautaruukki Oy (Government, 41.8%)	Plants at Halikko, Hameenlinna, Kankaanpaa, and Raahe	2,100
Do.		Fundia AB (Norsk Jenverk AS of Norway, 50%, and Rautaruukki, 50%)	Plants at Aminnefors, Dalsbruk, and Koverhar	850
Do.		Ovako Oy (SKF, 50%; Wartsila, 25%; Fiskas, 20%)	Plant at Imatra	600
Stainless		AvestaPolarit	Plant at Tornio	550
Talc		Mondo Minerals Oy (BHP Billiton, 50%, and Plüss-Staufer AG, 50%)	Mines at Lahnaslampi, Lipsavaara, and Horsmanaho	500
Wollastonite		Nordkalk Corp. (Rettig Group, 100%)	Mine and plant at Lappeenranta	40
Zinc:				
Ore, Zn content		Inmet Mining Corp.	Mine at Pyhasalmi	25
Metal		Outokumpu Oyj (Government, 40%, and private investors, 12.3%)	Smelter at Kokkola	260

Do., do. Ditto. NA Not available.

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The Mineral Industry of France

By Alberto Alexander Perez

France's gross domestic product (GDP) based on purchasing power parity was $2.178 trillion, which was 3.8% higher than the GDP of $2.097 trillion in 2009. France continued to have the third largest GDP in the European Union (EU) after Germany and the United Kingdom. The output value of France's entire industrial sector accounted for about 18.5% of the GDP in 2010. The country was a significant processor of raw mineral materials and a manufacturer of industrial and consumer durable goods. France's heavy industries, which, among other product categories, produced automotive and aviation products, chemicals, and machine tools for domestic consumption and export, relied mainly on imported metal ores and concentrates and on imported industrial minerals and mineral fuels (U.S. Central Intelligence Agency, 2011).

Minerals in the National Economy

During the past 20 years, France gradually transitioned from being a mineral producer and processor of mineral commodities to being mainly a processor. Most mining, and certainly mining of metals, had ceased in metropolitan France. Owing to the size and structure of France's economy, the upstream input of minerals was key to the continued maintenance and growth of the country's heavy industries. In 2010, France reported a net negative trade balance with fellow members of the EU of $103.7 billion[1] and a net positive balance with nonmembers of $12.1 billion; it had a net negative total trade balance of $91.47 billion (Eurostat, 2011b, p. 228–237).

Government Policies and Programs

The French Government's trend towards taking a smaller role in regulating private industry seemed to decrease as the recession prompted the Government to take direct action to try to stimulate the economy. This reversal is similar to what happened in other countries in the world, including the United States, during 2009. The French Government created the Fond Strategique d'Investissement (FSI) or strategic investment fund, to direct Government investments in private industry. The FSI planned to invest $2.78 billion per year in private industry (Economist, The, 2009).

The Ministry of Ecology and Sustainable Development was responsible for overseeing and regulating such environmental issues as agricultural runoff; air pollution from industrial and vehicle emissions; forest damage from acid rain; and water pollution from mining, mineral processing, and urban waste. The Government had created the Agency for Industrial Innovation [Agence de l'Innovation Industrielle] (AII) in June 2005. In 2008, the AII was integrated into a new association called OSEO, which was created to fund and help businesses—particularly small- and medium-sized businesses—develop and finance innovation. In 2009, OSEO received the approval of the French President to invest $2.08 billion in technological development and research and entrepreneurship. An important aspect of this investment was its emphasis on the promotion and development of new technologies by small- and medium-sized businesses that otherwise would not have access to funds to develop their research (OSEO, 2010).

Production

In 2010, the mineral industry of France trended generally toward increased production owing to a recovery in the international prices of many mineral commodities. Ferroalloys production increased by 54%; silicon metal, by 40%; alumina, by 38%; secondary aluminum, by 33%; pig iron, by 25%; crude steel by 20%; and primary aluminum, by 3.1%. There were also reductions in the output of kaolin (by 39.3%) and salt (5%) whereas the output of crude petroleum remained steady. Other significant increases or decreases shown in table 1 and not mentioned here might be subject to future revisions as estimated production data are revised (table 1).

Mineral Trade

Most of France's demand for fuel and nonfuel mineral raw materials was met by imports. The major commercial partners of France were all members of the EU and included Belgium, Germany, Italy, and Spain. The leading non-EU commercial partner of France was the United States. In 2010, exports from France to other countries in the EU[2] included manufactured metals, which were valued at $7.53 billion; nonferrous metals, $4.99 billion; and metalliferous ores and metal scrap, $4.6 billion. Imports by France of goods originating from other countries in the EU included manufactured metals valued at $13.60 billion, nonferrous metals valued at $6.62 billion, and metalliferous ores and metal scrap valued at $2.27 billion. In contrast, France's leading mineral industry imports, in terms of value, from a non-EU country (not including mineral fuels) were manufactured metals valued at $2.7 billion and nonferrous metals valued at $2.53 billion (Eurostat, 2011a, p. 110–112, 118–120, 136–138,134–138).

The most significant component of France's mineral trade in 2009 (the latest year for which data were available) were the net imports of mineral fuels; France imported 72.25 million metric tons (Mt) of crude petroleum, which was a decrease of 13.5% compared with the imports of crude petroleum in 2008. Of this amount, France imported at least 32% from the

[1]Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at an average exchange rate of €.755=US$1.00.

[2]In the European Commission's official reports, exports from one member country to other countries within the European Union (EU) are referred to as "dispatches" and imports by a member country from other countries in the EU are referred to as "arrivals."

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Commonwealth of Independent States, principally, in order of volume imported, from Russia, Kazakhstan, and Azerbaijan. At least 16% of French crude petroleum came from Africa; 13%, from Norway; 8%, from Saudi Arabia; 4%, from Iran; and 3%, from Iraq. The remaining 24% came from other sources.

France imported 37.46 Mt of petroleum products in 2009, which was an increase of 10.48% compared with the amount imported in 2008. It exported 22.45 Mt, which was a decrease of 18.79% compared with that of 2008, continuing in 2009 the country's trend as a net importer of petroleum products (Köppl, 2010, p. 2–5, 8).

Structure of the Mineral Industry

Although France continued to maintain state monopolies in a number of sectors of the economy, principally in the energy production and transport sectors, state ownership of the mineral sector was minimal. In 2010, the French Government maintained partial ownership of the country's electricity-generating and natural gas production and distribution facilities, as well as rail and public transportation systems in most French cities. Table 2 provides data on the major French-owned enterprises that produced metals, industrial minerals, and mineral fuels in 2010.

Commodity Review

Metals

Aluminum.—In 2010, France's output of primary aluminum increased by 3.1% and that of secondary aluminum production increased by 33% (table 1). Rio Tinto Ltd. was the country's sole producer of primary aluminum. Rio Tinto also operated facilities for the production of alumina and aluminum semimanufactures. At the end of 2008, Rio Tinto closed the Gardanne refinery and ceased production of smelter-grade alumina, although it continued to produce specialty alumina at the Gardanne specialty alumina plant (Rio Tinto Ltd., 2010, p. 82; 2011).

Bismuth.—Orrion Chemicals Specialmin S.A. stated that its operations at Orrion Chemicals Specialmin (previously Pharmacie Central de France) had developed a full European distribution organization for its specialty chemicals (Orrion Chemicals Specialmin S.A., 2011).

Ferroalloys.—The Brazilian company Vale S.A. invested $34.7 million in its subsidiary Vale Manganese France S.A., which was located in Dunkerque. Vale rebuilt the electric furnace and began production during the summer. The plant had the capacity to produce 140,000 metric tons per year of ferromanganese (Bouet, 2009; Vale S.A., 2011).

Iron and Steel.—France's output of pig iron increased by 25% to 10.1 Mt, which reversed a trend of decreased production in recent years. Crude steel production increased by 20% to 15.4 Mt, also reversing the same decreased production trend (table 1). Crude steel consumption increased by 25.6%, which was the equivalent of slightly more than 3.16 million metric tons per year (Mt/yr) (World Steel Association, 2011, p. 88).

Industrial Minerals

France produced a broad variety of industrial minerals. In 2010, Imerys S.A., which was a major French producer of industrial minerals, mined and processed ball clays, carbonates, feldspar, and red clays domestically and from deposits in such countries as China, Germany, Spain, the United States, and Vietnam for domestic use and export (Imerys S.A., 2011, p. 11–13).

Cement.—In 2010, cement consumption in France decreased by 2.9% compared with that of 2009 owing to a 3% decrease in the total construction sector output; a slight recovery in construction sector output was expected in 2011. France's principal cement manufacturers were Lafarge S.A. and Société des Ciments Français, which was a subsidiary of Italcementi S.p.A of Italy. In addition to their cement-producing facilities in France, both companies had major capital assets abroad. The other significant producers of cement in France were the Vicat Group, which had five plants with a total cement production capacity of 6 Mt/yr, and Ciments d'Origny, which had six plants and a total cement production capacity of 4.2 Mt/yr (Cembureau, 2011, p. 9).

Mineral Fuels and Other Sources of Energy

Of the total amount of primary energy consumed by France in 2009 (the latest year for which data were available), 48.2% was electricity generated by hydraulic, nuclear, photovoltaic, thermal electric, and wind power facilities, which was a decrease of 5.5% from 2008. Although energy consumption decreased by 5.2% the consumption of renewable energy increased to 6.2% of total energy consumption in 2009. Nuclear energy accounted for an estimated 94.6% of primary electricity production. The principal sectors that consumed energy in France were the residential sector, which accounted for 44% of total energy consumption in the country; the transportation sector, 31.9%; the manufacturing industry [as defined by the Institut National de la Statistique et des Études Économiques (INSEE)], 18.7%; the steel industry, 2.7%; and agriculture, 2.6% (Institut National de la Statistique et des Études Économiques, 2010).

Natural Gas and Petroleum.—In 2010, France's domestic production of crude petroleum remained stable compared with the output in 2009. The production of natural gas decreased by an estimated 13.8%, which continued the trend of a substantial production decline since 2005. Domestic production of petroleum products declined by about 15.1% in 2009 (the latest year for which production data were available) compared with that of 2008 (U.S. Energy Information Administration, 2011).

Nuclear Energy.—In 2009 (the latest year for which data were available), France had 59 active nuclear powerplants, which produced 94.6% of the primary electricity in France. Group Areva, which was the French Government-owned nuclear technology company, was building the first nuclear reactors in Western Europe in 20 years. Areva's reactor, which is called a Third Generation, or EPR (Evolutionary Power Reactor, or European Pressurized Reactor, as it is known in Europe), had helped the company compete for new construction contracts for nuclear powerplants in France and abroad. In August 2010, construction of the

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International Thermonuclear Experimental Reactor (ITER) complex began in Cadarche in the Provence-Alpes-Côte d'Azur region. It was expected to take 18 months to complete. The seven participants in the ITER project were China, the EU, India, Japan, the Republic of Korea, Russia, and the United States. The project is based in the toroidal magnetic field (Tokamak) reactor, and seeks to change nuclear power production from nuclear fission-generated energy to fusion-generated energy (International Thermonuclear Experimental Reactor, 2011).

Outlook

Despite the nuclear catastrophe in Japan caused by the 2010 earthquake and subsequent tsunami, France's nuclear industry is expected to continue to grow. Future investment in the development and promotion of the nuclear energy sector will depend on the composition of future Governments, as a portion of the political establishment has followed a campaign to curb France's reliance on nuclear power. France is likely to continue to produce consumer and producer durables and such intermediate products as ferrous and nonferrous metals and semimanufactures, construction materials, and chemicals, although much of its ores and mineral intermediate manufactured goods will continue to be imported. France's share of consumption of total energy provided by renewable energy is expected to grow as the Government, through OSEO, continues to invest and promote this sector. Nuclear energy appears to be the focus of the Government's energy generation strategy for the near future.

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TABLE 1

FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Bauxite, gross weight[e, 3]	thousand metric tons	168	160	160	160	--
Alumina, metallurgical, gross weight[e]	do.	200	500	592	348	481
Metal:						
Primary	do.	442	428	389	345	356
Secondary	do.	231	225	209	138	184
Antimony, metal, including regulus[e]		500	500	500	500	500
Cadmium metal[e]		100	50	50	50	50
Cobalt, metal:						
Powder[e]		500	500	500	500	500
Chloride		256	305	310	310	300
Gold, mine output, Au content[e]	kilograms	1,500	1,500	1,500	1,500	1,500
Iron and steel:						
Metal:						
Pig iron	thousand metric tons	13,013	12,425	11,372	8,104	10,137
Ferroalloys, electric furnace:[e]						
Ferromanganese	do.	137	144	47	46	138
Ferrosilicon	do.	100	100	100	20	27
Silicomanganese	do.	63	65	60	54	62
Silicon metal[e]	do.	100 r	120 r	118 r	80 r	112
Other	do.	60	60	60	60	60
Total	do.	460 r	489 r	385 r	260	400
Steel:						
Crude	do.	19,857	19,252	17,900	12,840	15,414
Hot-rolled	do.	17,028	16,903	14,746	11,382	13,581
Lead, refined:[e]						
Primary		4,039 [4]	--	--	-- r	--
Secondary		100,195 [4]	88,000	82,000	82,000	82,000
Total		104,234 [4]	88,000	82,000	82,000 r	82,000
Nickel, refinery products, Ni content[5]		13,700	16,400 e	13,400 e	14,000	14,000
Silver:[e]						
Mine output, Ag content	kilograms	700	700	--	--	--
Metal, Ag content of final smelter products	do.	400	400	--	--	--
Tin, secondary[e]		1,500	1,500	1,500	1,500	1,500
Zinc metal, including slab and secondary		120,000	129,000	118,900	118,000 e	118,000 e
INDUSTRIAL MINERALS						
Abrasives, undifferentiated[e]		272	272	270	270	270
Barite, $BaSO_3$ equivalent[e]		30,000	--	--	--	--
Cement, hydraulic	thousand metric tons	22,300	22,300 e	21,400	18,300	17,998
Clays:						
Kaolin and kaolinitic clay (marketable)	do.	300 e	307	624 r	519	315
Refractory clay, unspecified[e]	do.	15	15	15	15	15
Diamond, synthetic, industrial[e]	thousand carats	3,600	3,600	3,600	3,600	3,600
Diatomite[e]	thousand metric tons	75	75	75	75	75
Feldspar, crude[e]	do.	650	650	650	650	650
Fluorspar, marketable	do.	40 e	--	--	--	--
Gypsum and anhydrite, crude[e]	do.	3,500	3,500	3,500	3,351 [4]	3,440 [4]
Kyanite, andalusite, related materials[e]	do.	65	65	65	65	65
Lime, quick and hydrated, dead-burned dolomite[e]	do.	3,500	4,000	4,000	4,000	4,000
Mica[e]		20,000	20,000	20,000	20,000	20,000
Nitrogen, N content of ammonia[e]	thousand metric tons	616	800	800	2,970 [4]	3,517 [4]
Pigments, mineral, natural, iron oxide[e]		1,000	1,000	1,000	1,000	1,000

See footnotes at end of table.

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TABLE 1—Continued

FRANCE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Phosphates, Thomas slag[e]	thousand metric tons	50	50	50	50	50
Pumice and other natural abrasives[e]	do.	272 [4]	276	270	270	270
Salt, all sources[e]	do.	9,371 [4]	6,140	6,240	6,200	5,867
Sodium compounds:[e]						
Soda ash	do.	1,000	1,000	1,000	1,000	1,000
Sodium sulfate	do.	120	120	120	120	120
Stone, sand and gravel:						
Chalk	do.	554	583	580 [e]	1,294	1,765
Dolomite, crude	do.	991	984	980 [e]	777	700
Granite, crude	do.	245	373	370 [e]	403	426
Limestone, agricultural and industrial	do.	11,018	11,699	11,700 [e]	8,302	9,102
Marble and travertine, crude	do.	130	148	150 [e]	150 [e]	150 [e]
Sandstone	do.	32	95	95 [e]	109	100
Slate, crude		5,703	8,716	8,700 [e]	8,700 [e]	8,700 [e]
Sand and gravel:[e]						
Industrial sands		5,200	5,200	5,200	7,442 [4]	8,498 [4]
Other sand, gravel, and aggregates		165,000	165,000	165,000	263,530 [4]	249,512 [4]
Sulfur, all sources[e]		650	650	650	650	650
Talc, crude[e]	thousand metric tons	420	420	420	420	420
MINERAL FUELS AND RELATED MATERIALS						
Asphaltic material[e]		20,000	20,000	20,000	11,675 [4]	11,600
Carbon black[e]		200,000	200,000	200,000	178,777 [4]	203,563 [4]
Coal, briquets[e]	thousand metric tons	100	100	100	100	100
Coke, metallurgical[e]	do.	4,500	4,500	4,500	4,500	4,500
Gas, natural, marketed	million cubic meters	1,840	1,642	1,472	1,444	1,245
Petroleum:						
Crude	thousand 42-gallon barrels	7,604	7,242	7,117	6,624	6,606
Refinery products:						
Liquefied petroleum gas	do.	32,167	30,358	33,860	29,236 [r]	29,000 [e]
Gasoline, all kinds	do.	146,709	142,069	141,195	133,225 [r]	130,000 [e]
Kerosene and jet fuel	do.	45,350	44,293	44,462	39,274 [r]	35,000 [e]
Distillate fuel oil	do.	256,043	259,550	275,148	246,959 [r]	240,000 [e]
Residual fuel oil	do.	88,263	73,803	73,342	61,137 [r]	60,000 [e]
Other products	do.	115,858	115,335	124,347	107,748 [r]	105,000 [e]
Total	do.	684,390	665,408	692,354	617,579 [r]	599,000 [e]

[e]Estimated; estimated data rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 31, 2012.

[2]In addition to the commodities listed, France produces germanium from domestic ores, but actual output is not regularly reported.

[3]Reprocessed bauxite not for metallurgical use.

[4]Reported figure

[5]Excludes secondary production from nickel-cadmium batteries.

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TABLE 2
FRANCE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, metallurgical		Rio Tinto Ltd.	Plant at Gardanne	700
Aluminum		do.	Aluminum smelters at:	
Do.		do.	Saint-Jean-de-Maurienne, Savoie	120
Do.		do.	Pyrenees, Atlantiques Province	115
Do.		do.	Lannemezan, Hautes-Pyrenees	63
Do.		do.	Dunkerque, Calais du Nord	250
Andalusite		Denain-Anzin Minéraux Réfractaire Céramique	Glomel Mine, Brittany	75
Antimony, metal		Produits Chimiques de Lucette	Plant at Le Genest, Mayeene Province	15
Barite		Barytine de Chaillac	Mine and plant at Chaillac	150
Do.		Société Industrielle du Centre	Mine at Rossigno, Indre Province	100
Cadmium	metric tons	Compagnie Royale Asturienne des Mines	Plant at D'Auby-les-Douai	200
Cement		Four companies, of which the largest are:	80 plants, including:	26,700
Do.		Lafarge S.A.	13 plants; largest at St. Pierre-la-Cour (1,160)	9,500
Do.		Société des Ciments Français	9 plants; largest at Gargenville (1,100)	7,500
Clay, kaolin		Groupe Mineral Harwanne (GMH)	Kaolin d'Arvor Mine, Quessoy	300
Cobalt, metal	metric tons	Société Métallurgique le Nickel (SLN)	Plant at Sandouville, near Le Havre	600
Copper, metal		Compagnie Générale d'Électrolyse du Palais	Electrolytic plant at Palais-sur-Vienne	45
Do.		Société Française d'Affinage du Cuivre	Smelter at Carrieres-sous-Poissy	11
Diatomite		Ceca S.A.	Mines and plants at Riom-les-Montagne and St. Bauzille	100
Feldspar		Denain-Anzin Mineraux S.A. (Imerys Group)	Mine and plant at St. Chely d'Apcher	55
Ferroalloys		Comilog Dunkerque (Groupe ERAMET, 100%)	Dunkerque	70
Do.			Plants at Anglefort, Laudun-L'ardoise, Petit-Coeur, Gavet and Saint-Julien-Montdenis	148
Gypsum		S.A. de Matériel de Construction	Mine at Taverny	1,500
Iron and steel, steel		AcelorMittal Group	Dunkerque	6,700
Do.		do.	Fos-sur-Mer	4,200
Do.		do.	Florange	3,200
Do.		Usinor Group	Gadrange, Neuves Maisons	8,400
Mica		Denain-Anzin Minéraux S.A. (Imerys Group)	Mine at Ploemeur, Brittany	160
Natural gas	million cubic meters	Société Nationale Elf Aquitaine (SNEA)	Gasfield and plant at Lacq	20,000
Nickel, metal		Société Métallurgia le Nickel (SLN)	Plant at Sandouville	16
Nitrogen, N content of ammonia		Grande Paroisse S.A.	Plant at Grandpuits	390
Petroleum:				
Crude	42-gallon barrels per day	Société Nationale Elf Aquitaine (SNEA)	Paris Basin oilfields	1,000
Refined	do.	Total S.A.	Refineries at Gonfreville and La Mede	446,000
Do.		Shell-Française	Refinery at Petite Couron	285,000
Do.		do.	Refinery at Berre	270,000
Do.		Société Nationale Elf Aquitaine (SNEA)	Refinery at Feyzin	120,000
Do.		do.	Refinery at Donges	200,000
Do.		do.	Refinery at Grandpuits	96,000
Do.		Ineos Group Ltd.	Refineries at Lavera	175,000
Do.		Esso S.A.	Refineries at Fos-sur-Mer	237,000
Do.		do.	Refineries at Gravenchon	62,000
Do.		Cie. Rhenane de Raffinage (CRR)	Refinery at Reichstett	80,000
Salt		Compagnie des Salins du Midi et des Salines de l'Est (Salins Group)	Mines and plants at Algues Mortes, Dax, Salin de Girad, and Varangeville	2,500
Sulfur		Société Nationale Elf Aquitaine (SNEA)	Byproduct from natural gas, Lacq plant	3,000
Talc		Talc de Luzenac S.A. (Rio Tinto Ltd., 100%)	Trimouns Mine near Ariege, Pyrenees	350
Uranium, U_3O_8	metric tons	Compagnie Général des Matières Nucléaires (Areva S.A., 100%)	Mines at Limousin, and Vendee	1,800
Zinc, metal		Umicore Group	Plants at Auby-les-Douai and Calais	220
Do. Ditto.				

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The Mineral Industry of Georgia

By Elena Safirova

Prior to the proclamation of Georgian independence in 1991, a range of mineral commodities were mined in Georgia, including arsenic, barite, bentonite, coal, copper, diatomite, lead, manganese, zeolites, and zinc, among others. The country's metallurgical sector produced ferroalloys and steel. Since 1991, production of many of these mineral commodities had ceased or been significantly reduced.

Georgia had a sizable hydropower capacity, only a fraction of which was being used. In recent years, Georgia had become a major exporter of electricity in the region, exporting 1.3 billion kilowatthours in 2010. Hydropower stations in Georgia produced 80% to 85% of the electricity used in the country, and the remaining 15% to 20% was produced by thermal power stations. According to the Ministry of Energy, Georgia had thus far been exploiting only 18% of its hydropower resource potential. The country was planning to begin construction of 15 new hydropower stations of various sizes and capacities. All together, the new plants would have the capacity to produce 2 billion kilowatthours per year of electric power (Borodin, 2011; U.S. Central Intelligence Agency, 2012).

In 2010, Georgia imported about 80% to 90% of the petroleum used for domestic consumption, mostly from Azerbaijan. In the past, natural gas was supplied to Georgia by Russia. In recent years, however, Georgia had been trying to reduce its dependence on Russian gas imports by boosting hydropower production and importing natural gas from Azerbaijan. All Russian gas exports to Armenia passed through the Georgian pipeline system, and Georgia received 10% of the gas as a transit fee (U.S. Department of State, 2012).

Minerals in the National Economy

In 2010, the gross domestic product (GDP) of Georgia increased by 8.0% compared with that of 2009, to $11.6 billion. Real GDP increased by 6.3% in 2010 compared with that of 2009. The share of industrial production in the GDP in 2010 was 27.1%. Mining and quarrying accounted for 5.3% of the value of industrial production; and the mining of metal ores contributed 49.3% of the total value of mining and quarrying (National Statistics Office of Georgia, 2011c).

In 2010, foreign direct investment (FDI) increased by 23.7% to $814.5 million from $658.4 million in 2009. The United States was the leading investor in Georgia (provided 16.7% of the total FDI received by Georgia) in 2010, followed by Turkey (11.3%), the Netherlands (9.0%), the United Kingdom (7.2%), Azerbaijan (7.1%), and the United Arab Emirates (6.8%). The FDI by the European Union was $248 million, or 30% of the total. The FDI in mining and manufacturing was $228.8 million, or 28.1% of the total (National Statistics Office of Georgia, 2011b).

In 2010, Georgia ran a substantial trade deficit—the total value of its exports ($1.68 billion) was far exceeded by the total value of its imports ($5.26 billion). The country's major export trade partners were, in order of value, Azerbaijan (which received 15.4% of Georgia's exports), Turkey (13.6%), the United States (11.4%), Armenia (10.1%), Ukraine (6.5%), and Canada (5.5%). Its major import trade partners were, in order of value, Turkey (which supplied 17.4% of Georgia's imports), Ukraine (11.0%), Azerbaijan (9.1%), China (6.6%), Germany (6.5%), and Russia (5.5%). Mineral commodities, especially metals, played a significant role in the country's exports. Ferroalloys accounted for 16.7% of the country's total export value; ferrous waste and scrap, 6.9%; gold, 5.4%; copper ores and concentrates, 4.5%; and copper waste and scrap, 2.6%. Among the country's imports, the largest single category was petroleum, petroleum products, and other hydrocarbons, which made up 16.2% of the total (National Statistics Office of Georgia, 2011a).

Production

Most of the data in table 1 were estimated because 2010 production data for most mineral commodities were not available. Because of the reported increases in Georgia's GDP, its industrial output, and the value of output in the mining and refining sectors, the production volumes of metals, industrial minerals, and mineral fuels were estimated to have increased in 2010. Production of ferromanganese increased by an estimated 93.3%; that of silicomanganese, by an estimated 81.6%; bituminous coal, by an estimated 42.8%; gypsum, by an estimated 20.0%; and steel-reinforcing bar (rebar), by 20.0%. At the same time, production of copper decreased by 44.5%, and that of natural gas, by 35.2%. Other production data are in table 1.

Structure of the Mineral Industry

Georgia's main nonferrous and precious metals mining enterprise was JSC Madneuli, which mined a large copper-gold and barite deposit. The former Madneuli mining and beneficiation complex had been transformed in 1994 into JSC Madneuli, in which the controlling interest belonged to the state. In 2005, after changing hands several times, Madneuli became a part of the holding company GeoProMining Ltd. (GeoProMining Ltd., 2011). In 2006, British company Stemcor Holdings Ltd. merged three separate organizations into one entity to create the largest industrial company in Georgia. The three organizations were the Chiatura Manganese Mine, Zestafoni Ferroalloys Plant, and Vartshikhe Hydroelectric Power Plant. The name of the new establishment was Georgian Manganese Holding LLC, and in 2010, it employed a total of 7,000 workers. Georgian Manganese Holding was owned by the Privat Group of Ukraine (Stemcor.com, 2008).

Another Soviet-era metal plant, the Rustavi metallurgical plant, was acquired by JSW Steel Ltd. of India, which was

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India's third ranked producer. JSW bought the Rustavi plant in 2006 and invested $70 million in upgrades; the European Bank for Reconstruction and Development invested another $14 million in this project. The goal of the reconstruction was to produce 200,000 metric tons per year (t/yr) of rebar (Bedwell, 2009).

The Kutaisi metallurgical plant was a new joint venture with Indian steel producer EurAsia Steel. The construction of the plant started in 2008 on the site of the former Kutaisi concrete structures plant. The plant was expected to reach its full production capacity of 100,000 t/yr of rebar in 2010 (Steelguru.com, 2010).

Commodity Review

Metals

Copper.—The Madneuli deposit of polymetallic ores is situated in the Bolnisi Region in southern Georgia about 80 kilometers south of Tbilisi near the borders with Armenia and Azerbaijan. The company was established in 1975 and had a long history as a respected precious metals producer in the region. The main ore types at Madneuli are barite-polymetallic ore, copper-barite ore, copper-zinc ore, gold-copper ore, and quartzite ore (JSC Madneuli, 2012). The company's primary focus was on copper, and more than 65% of the company revenue came from the sale of copper (JSC Madneuli, 2012). According to the company's Web site, annual production of copper was about 11,000 t. In 2010, Madneuli invested 1 million Georgian laris ($561,073)[1] in corporate social responsibility activities, including cultural events, education, and restoration of churches and historic monuments.

Manganese.—For more than a century, Georgia had mined manganese ore from the Chiatura deposit. A portion of the ore was used to produce manganese ferroalloys at the Zestafoni ferroalloys plant. Since 2006, both the Chiatura Mine and the Zestafoni plant had been a part of Georgian Manganese Holding (which was owned by the Privat Group). As of the 1980s, the Chiatura deposit's resources were estimated to be 215 million metric tons (Mt) of manganese ore; by 2010, about one-half of that amount had been mined. The Chiatura manganese mine included four mines and three open quarries; the mine's annual production capacity was about 400,000 t/yr (Felman Trading Inc., 2012).

In April and May 2010, workers from the Chiatura and Zestafoni facilities held protest demonstrations demanding improvement in working conditions. Their demands included a 50% increase in pay, special pay for overtime and overnight work, and an increase in vacation time from 24 to 35 days per year. In June 2010, the Privat Group decided to satisfy workers' demands partially and increased the base pay by 15%, introduced a 20% premium for the overnight shift, and increased the minimum wage by almost 40% (Ugmk.info, 2010).

Outlook

In the years following Georgia's independence in 1991, the country experienced economic and political turmoil that resulted in a significant contraction of its economy. By the end of 1996, Georgia's economy had shrunk to about one-third of the 1989 level. The turmoil affected the entire Georgian economy, including the mineral industry. After the Rose Revolution of 2003, however, the new Georgian Government set out to reorient the economy toward privatization and free markets. The country conducted a sweeping tax reform and significantly reduced corruption. According to The World Bank, Georgia is one of the world's fastest-reforming economies, and in 2011, it ranked as the world's 16th easiest place to do business. With such a record, it is expected that Georgia will be able to attract foreign investment in its minerals and mining sectors and take full advantage of its significant natural resources in the next 5 to 10 years (U.S. Department of State, 2012).

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[1]Where necessary, values have been converted from Georgian laris (GEL) to U.S. dollars (US$) at an annual average exchange rate of GEL1.7823=US$1.00 for 2010.

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TABLE 1

GEORGIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Copper, mine output, Cu content of concentrate		9,000	11,000	11,000	11,000 r	6,100
Gold	kilograms	2,000 r	2,000	2,000	2,000	2,000
Iron and steel:						
Ferroalloys, electric furnace:e						
Ferromanganese		5,130 3	5,000	5,000	4,500	8,700
Silicomanganese		116,945 3	120,000	120,000	112,016 r, 3	203,464 3
Total		122,075 3	125,000	125,000	116,516 r, 3	212,164 3
Steel, rebar		NA	NA	NA	70,000	84,000
Lead, mine output, Pb content		400	400	400	400 r	400
Manganese ore, marketable:e						
Gross weight		328,643 3	350,000 3	400,000	400,000 r	400,000
Mn content		95,300	102,000	116,000	116,000 r	116,000
Silver	kilograms	1,000	1,200	1,360	1,200	1,200
Zinc, mine output, Zn content of concentrate		400	400	400	300	300
INDUSTRIAL MINERALS						
Cement:e		450,000	450,000	450,000	870,368 r, 3	856,880 3
Clays, bentonite:e		4,487 3	5,000	5,000	5,000 r	5,000
Gypsum:e		123 3	125 3	125	100	120
Nitrogen, N content of ammonia		140,000	150,000	150,000	150,000 r	150,000
Perlite		45,000	45,000	45,000	45,000 r	45,000
Salt		30,000	30,000	30,000	30,000	30,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, bituminous:e		8,284 3	8,280	11,000 r	168,451 r, 3	240,628 3
Natural gas	thousand cubic meters	9,890 r	9,890 r	7,910 r	12,200 r, 3	7,900 3
Petroleum:						
Crude:e						
In gravimetric units		63,506 3	63,500	63,500 r	53,942 r, 3	51,050 3
In volumetric units	42-gallon barrels	462,000	462,000	462,000	392,000	371,000
Refinery products:						
In gravimetric units		78 r	244 r	313 r	NA r	NA
In volumetric units	42-gallon barrels	627	1,960	2,520	NA	NA

eEstimated data are rounded to no more than three significant digits; may not add to totals shown. rRevised. NA Not available.

[1]Table includes data available through March 15, 2012.

[2]In addition to the commodities listed, Georgia had also produced barite and zeolites, but available information was inadequate to make reliable estimates of output.

[3]Reported figure.

TABLE 2

GEORGIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1]	Location or deposit names[1]	Annual capacity[e]
Arsenic:	Includes:	Of which:	2,000 2
As content of ore	Racha mining and chemical plant	Lukhumi deposit, Ambrolauri region	
	Tsana mining and chemical plant	Tsana deposit, Lentekhi region	
Metal and compounds	Racha mining and chemical plant	Racha region	
	Tsana mining and chemical plant	Ts'ana region	
Barite	NA	Chordskoye deposit, Onis Raioni	70,000
Do.	JSC Madneuli (GeoProMining Ltd., 97%)	Madneuli deposit	NA
Barite-zinc ore	NA	Kvaisi deposit	NA

See footnotes at end of table.

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TABLE 2—Continued
GEORGIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[1]	Location or deposit names[1]	Annual capacity[e]
Bentonite		Includes:	Of which:	200,000 [2]
		Askana LLC (Silver & Baryte Ores Mining Co., 97.7%)	Askanskoye deposit, Ozurget'i	
		NA	Gumbrskoye deposit, Gumbra region	
Cement		LLC Kartuli Cementi (LLC HeidelbergCement Caucasus Shared Services, 70%)	Kaspi and Rust'avi	1,100,000
Do.		LLC SaqCementi (LLC HeidelbergCement Caucasus Shared Services, 75%)	Rust'avi	500,000
Coal		JSC Tkibulnakhshiri	Akhaltsikhe, Tkibuli-Shaorskoye, and Tkvarchelskoye deposits in Akhalts'ikhis Raioni, Tqibuli, and Tqvarch'eli regions	300,000 [2]
Copper, Cu content of ore		JSC Madneuli (GeoProMining Ltd., 97%)	Bolnisi region	12,000
Copper-gold ore		Trans-Georgian Resources (GeoProMining Ltd., 50%)	Sakdrisi deposit	NA
Diatomite		NA	Kisatibskoye deposit, K'isat'ibi region	150,000
Ferroalloys:				
Ferromanganese		Georgian Manganese Holding LLC (Privat Group of Ukraine)	Zestafoni ferroalloys plant, Zestap'onis Raioni	100,000
Silicomanganese		do.	do.	250,000
Manganese sinter		do.	do.	250,000
Gold, mill		Quartzite Ltd. (GeoProMining Ltd.)	Madneuli deposit	NA
Iron and steel:				
Steel, rebar		Kutaisi metallurgical plant	K'ut'aisi	100,000
Do.		Rustavi metallurgical plant	Rust'avi	125,000
Iron ore		NA	Hrazdan deposit	NA
Do.		NA	Tkibuli-Shaorskoye deposit, Tqibuli region	NA
Lead-zinc:				
Pb content of ore		NA	Kvaisi deposit	1,200
Zn content of ore		NA	do.	3,000
Manganese, marketable ore		Chiaturamanganumi enterprise of Georgian Manganese Holding Limited LLC (Privat Group of Ukraine)	Chiatura deposit	500,000
Nitrogen		JSC Azoti chemical plant	Rust'avi	NA
Petroleum:				
Crude		Saknavtobi Oil and Gas Co. and most Georgian petroleum companies in joint ventures with Frontera Resources, Ioris Valley Oil & Gas Ltd., Ninotsminda Oil Co. Ltd., Georgian-British Oil Co. (GBOC), Anadarko Petroleum Corp., and GeoGeroil	About 60 wells that account for 98% of output in Mirzaani, Sup'sa, and Zemo T'elet'i regions	200,000 [2]
Refined	42-gallon barrels per day	LLC Terminal	Batumi refinery, Ajaria	NA
Do.	do.	NA	Georgian American Oil Co. Refinery (GAOR), Sart'ichala	4,000 [3]

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.
[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.
[2]Capacity estimate is the total for all enterprises that could produce that commodity.
[3]Closed.

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THE MINERAL INDUSTRY OF GERMANY

By Steven T. Anderson

In 2010, Germany was a leading global exporter of industrial goods and services (including processed and fabricated mineral products). The country's mineral industry, however, depended heavily on imported mineral raw materials. Germany was the leading producer of lignite in the world, and essentially all the lignite consumed in the country was supplied by domestic production. Combustion of lignite accounted for 10.8% of total primary energy consumption in the country. Germany was dependent on imports of other mineral fuels for most of the remainder of its primary energy consumption, and combustion of petroleum and petroleum refinery products accounted for 33.3% of total primary energy consumption in Germany; that of natural gas, 21.9%; and that of bituminous and anthracite (hard) coal, 12.2%. Nuclear energy accounted for 10.9% of total primary energy consumption; renewable energy resources, such as wind power, accounted for 9.4%; and other energy sources, including imported electricity, accounted for 1.5%. Germany's metal processing sector relied on imports of metal ores and concentrates and reprocessing of metallic scrap and waste materials (both imported and produced domestically) because no metals were mined in sufficient amounts for metallurgical use in the country. Germany was also heavily reliant on imports of numerous industrial minerals and many refined metals (Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 15–35, 44, 157; Bundesministerium für Wirtschaft und Technologie, 2011, p. 5–12, 28–30).

In 2010, the country was estimated to have been the second ranked producer of refined selenium in the world; it was the third ranked producer of kaolin (and was estimated to have accounted for 13.6% of global production), salt (6.8%), and refined lead (4.2%); Germany was estimated to be the fourth ranked producer of sulfur (all forms), and was the fifth ranked producer of potash (9.0%) and bentonite (3.3%), the sixth ranked producer of refined copper (3.7%), and the seventh ranked producer of crude steel (3.1%). Additionally in 2010, Germany either produced or was estimated to have produced at least 1% of the world's output of primary aluminum, barite, refined cadmium, cement, feldspar, gallium, natural gypsum, indium, crude iron, iron oxide pigments (including synthetic iron oxide), lime, magnesium compounds (as byproducts of potash mining), nitrogen (ammonia), industrial quartz, silica (industrial sand and gravel), and zinc metal. Germany's domestic mineral processing sector was estimated to have accounted for at least 5% of the world's total production capacity of alumina, fused aluminum oxide (abrasive), graphite, magnesium metal (secondary), rhenium metal (byproduct), strontium compounds, and titanium dioxide pigments (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 17–18, 43–46, 114–116, 122–127, 130–133, 138–145, 154–156; U.S. Geological Survey, 2011, p. 6, 15, 17, 25, 35, 37, 39, 45, 55, 59, 71, 75, 79, 87, 93, 97, 113, 123, 135, 139, 143, 157, 159, 173).

Minerals in the National Economy

In 2010, the total value of Germany's industrial output (including the value of output by the country's mineral industry, but not that of the construction sector) accounted for about 21% (about $706 billion) of the gross domestic product (GDP). In 2009 [the latest year for which detailed information was available from the Federal Statistical Office of Germany (DESTATiS)], the total value of output by the country's metals processing sector (up to the foundry stage) accounted for about 3% ($101 billion[1]) of the GDP, and the minerals extraction sector [mining (including coal mining), quarrying, and the extraction of crude petroleum and natural gas] reportedly accounted for about 0.5% (about $15 billion) of the GDP. According to Germany's Federal Institute for Geosciences and Natural Resources (BGR), the value of the country's total production of mineral raw materials and fuels was about $23 billion in 2010 compared with about $24 billion in 2009, which would account for about 0.7% of the GDP during each year, but this BGR figure appears to include the value of production of some mineral products that are not included in the DESTATiS series (Bundesanstalt für Geowissenschaften und Rohstoffe, 2010, p. 21, 28, 35–39, 83; 2011, p. 15–18, 47; International Monetary Fund, 2011; Statistisches Bundesamt, 2012, p. 371, 619, 625, 631–633, 637).

Government Policies and Programs

Germany's main mining law is the Federal Mining Act (BGBl. IS. 1310), which was approved on August 13, 1980, and revised on December 9, 2006, through slight revision to provisions of Article 11 (BGBl. IS. 2833). The country's production of some minerals (including gypsum and anhydrite, limestone and some other types of natural stone, peat, and some types of sand and gravel) was not directly regulated under the Federal Mining Act, but was covered by a variety of other land-management and environmental regulations at both the Federal and State levels. Also, the organization of the Federal Mines Inspectorate was not determined in the Federal Mining Act (although this inspectorate does enforce many of the regulations in the main mining law); the Federal Mines Inspectorate was established through Articles 83 and 84 of Germany's Constitution.

During 2010, the Government program to phase out the subsidy for the mining of hard coal was ongoing and continued to adhere to a schedule to completely eliminate the subsidy by the end of 2018. In 2010, the total amount of this subsidy was scheduled to decrease to about 2 billion euros (about $2.7 billion)

[1]Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at an annual average exchange rate of about €0.6795=US$1.00 for 2008, €0.718=US$1.00 for 2009, and about €0.7536=US$1.00 for 2010. All values are nominal, at current prices, unless otherwise stated.

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compared with 2.2 billion euros (about $3.1 billion) in 2009 and 2.4 billion euros ($3.5 billion) in 2008, and the subsidy was scheduled to be further reduced to 1.8 billion euros in 2012 (Bundesministerium der Justiz, 2007, p. 1; Bundesministerium für Wirtschaft und Technologie, 2011, p. 9, 34–45; Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 17–19, 32–34; Gesamtverbands Steinkohle e.V., 2011, p. 12).

Production

Data on mineral production are in table 1. Production of most minerals and mineral-based products in Germany increased compared with that of 2009 mostly in response to increases in demand domestically and in the leading destination markets for Germany's mineral exports (especially in Europe). In 2010, a notable exception to the widespread recovery of production in this sector were decreases in the production of many secondary metals either in absolute terms or as shares in total production. For example, the share of secondary aluminum production in the total production of aluminum metal was 60% compared with about 66% in 2009, that of secondary smelter copper in total smelter copper production was 36% compared with about 46%, that of secondary refined copper in total production of refined copper was 43% compared with about 57%, and that of secondary refined lead in total production of refined lead was 69% compared with 73% in 2009. These relative decreases in secondary production of base metals in the country could have been primarily owing to a decrease in the availability (and an increase in the cost) of scrap metal compared with that of imported ores and concentrates, but accurate information concerning the changes, relative impacts, or importance of varying limiting factors or cost considerations (such as the cost of labor, energy, updates in technology, and so forth) for the secondary metals production sector in Germany was not available. In the case of aluminum, the share of secondary production in 2009 was substantially higher than the 54% share of secondary aluminum production in the total production of aluminum metal in 2008, possibly owing to attempts by aluminum producers to cut costs but still keep production facilities operating at least at some fraction of their full-scale capacity during the period of depressed demand from mid-2008 through most of 2009. In addition to the added cost of importing alumina and bauxite, primary aluminum costs much more to produce than secondary, primarily owing to the greater amounts of electrical power required (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 15, 19–25, 38–41).

According to the BGR, the most valuable minerals produced in Germany in 2010 were, in decreasing order of value of production, lignite ($9.0 billion); natural gas (about $3.9 billion); construction sand and gravel ($1.9 billion); crushed stone, including chalk ($1.6 billion); hard coal (about $1.5 billion); crude petroleum (about $1.2 billion); potash ($1.0 billion); rock salt and industrial brines, NaCl content ($800 million); kaolin ($613 million); dolomite, limestone and marble (about $598 million); ceramic and refractory clays (about $458 million); and silica sand ($248 million). Of these minerals commodities, those for which production increased by 10% or more compared with that of 2009 were marketable potash, by about 66%; rock salt and other brines, by about 20%; and silica sand, by 12%. Those for which production decreased by 10% or more were natural gas, by about 16%, and crude petroleum, by 10%. The decrease in production of natural gas was owing to the depletion of various gasfields, and that of crude petroleum was mostly owing to decreased production at the Mittelplate-Dieksand oilfield (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2010, p. 35–38; 2011, p. 18, 43–45; Landesamt für Bergbau, Energie und Geologie, 2011, p. 10).

Although Germany's level of marketable potash production in 2010 was still 8% lower than in 2008 and 17% lower than in 2007, the decreased use of fertilizers by the country's major customers for potash in 2009 resulted in increased fertilizer demand to replenish soils in 2010, and this, combined with increases in global grain prices during 2010, increased the demand for (and Germany's production of) potash. The country's production of salt increased in response to increased demand for deicing salt compounds during the relatively severe winter weather both at the beginning and end of 2010. In addition to the increase in the country's production of silica sand, its production of siliceous earth increased by about 16% compared with that of 2009. In 2010, about 85% of the country's production of silica sand was exported to Belgium and Luxembourg, but further information concerning the main causes of any changes in demand for silica or reliable information about the exact source(s) of the increased production of silica in Germany was not available (table 1; Bundesanstalt für Geowissenschaften und Rohstoffe, 2010, p. 35–38; 2011, p. 18, 43–45; K+S Aktiengesellschaft, 2011, p. 1, 43–45, 52–63, 78–81).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities. Since the closure of the last metal mines in 1992, there had been no mining of metallic minerals in Germany. Many of the leading companies in the global metals processing sector owned and operated significant facilities in Germany, however. ArcelorMittal (based in Luxembourg) was the leading producer of crude steel in the world and the second ranked producer in Germany. ThyssenKrupp AG (based in Duisburg) was the leading producer of crude steel in Germany and the 14th ranked producer of crude steel in the world. Aurubis AG (based in Hamburg) was the third ranked producer of marketable copper metal in the world and the leading producer of secondary refined copper. Aurubis was the leading producer of total refined copper in the EU. Salzgitter AG was the third ranked producer of crude steel in Germany and held a 25% ownership interest in Aurubis. Xstrata plc (based in Switzerland and registered in the United Kingdom) was the leading producer of zinc metal in Germany and the leading producer of mined zinc in the world. Norsk Hydro ASA of Norway was the second ranked producer of aluminum in Germany and the fifth ranked producer of primary aluminum in the world, and the company owned the largest single primary aluminum smelter in Germany (the Rheinwerk primary smelter at Neuss). Berzelius Metall GmbH, which was headquartered in Stolberg, was the leading producer of primary lead in the country (table 2; Aurubis AG, 2010, p. 1, 48, 55, 63–70; Bundesanstalt

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für Geowissenschaften und Rohstoffe, 2011, p. 36–41; Norsk Hydro ASA, 2011, p. 29–34; Stahlinstitut VDEh and Wirtschaftsvereinigung Stahl, 2011, p. 34–37, 39, 41–46; World Steel Association, 2011, p. 8; Xstrata plc, 2011, p. 23, 91).

S.C.R.-Sibelco NV of Belgium was the leading producer of olivine, plastic (ball) clays, quartz, and silica (industrial) sand in the world, and Sibelco Deutschland GmbH (a German subsidiary of S.C.R.-Sibelco) was Germany's leading producer of mineral raw materials for use in the production of ceramics. Other than this subsidiary of a multinational company, family-owned small- and medium-scale enterprises (SMEs) accounted for most of the remainder of the country's production of ceramic, kaolinitic, and plastic (ball) clays in the country. S&B Industrial Minerals S.A. of Greece was the leading producer of bentonite in the EU and the second ranked producer of bentonite in the world. Süd-Chemie AG was the leading supplier of bentonite-based adsorbents and additives in the world, and the company was the other major producer of bentonite in Germany (besides S&B). HeidelbergCement AG was the leading producer of cement in the country and the third ranked producer in the world. HeidelbergCement was also the world's leading producer of aggregates. K+S Aktiengesellschaft (K+S) was the leading producer of potash and salt (NaCl) in the EU, and the company was the leading producer of salt and the fourth ranked producer of potash in the world (table 2; Arbeitsgemeinschaft Westerwald-Ton e.V., 2010; HeidelbergCement AG, 2011, p. 8, 24; Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 43–46; K+S Aktiengesellschaft, 2011, p. 43–44; S&B Industrial Minerals S.A., 2011, p. 29; Süd-Chemie AG, 2011, p. 34, 52; Sibelco Deutschland GmbH, undated).

In 2010, RWE Power AG accounted for about 54% of the total production of lignite in Germany, and 88% of this lignite production was used to generate electricity domestically. RWE was the leading producer of electricity in Germany, and the third ranked producer in the Netherlands and the United Kingdom. About 90% of all the lignite produced in Germany was used domestically to produce electricity. In 2010, 72% of the salable production of hard coal in the country was used to produce electricity, about 25% was used to produce steel, and about 3% was used to produce thermal energy. On September 30, 2010, the Ost Mine was closed because the operation was no longer profitable to operate given the continuing reduction of the Government's hard coal subsidy. Reliable information concerning the individual production capacities of the five remaining hard coal mines in Germany was not available, especially as production may have been decreasing as these mines continue to get nearer to their expected closure dates (table 2; Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 29–34; Bundesministerium für Wirtschaft und Technologie, 2011, p. 6–12; Gesamtverbands Steinkohle e.V., 2011, p. 11–19; RWE Aktiengesellschaft, 2011, p. 1, 100).

Outlook

RWE expected that the company would complete construction and start up a modern lignite-fired powerplant in Neurath (near Cologne) by the end of 2011 and that this new powerplant would increase demand for (and the company's production of) lignite in Germany in 2012 and beyond. Germany appeared likely to continue to proceed towards elimination of the hard coal subsidy in the country by the end of 2018, and this was expected to cause the closure of the Saar Mine on July 1, 2012, and the West Mine at the end of 2012. This would leave only three mines producing hard coal in Germany in 2013. It was expected that Germany would produce about 12 Mt of hard coal in 2012, however (Bundesanstalt für Geowissenschaften und Rohstoffe, 2011, p. 12–14, 32–35; Gesamtverbands Steinkohle e.V., 2011, p. 14–18; RWE Aktiengesellschaft, 2011, p. 9, 96).

Future levels of production of fertilizer minerals, such as potash, in Germany were expected to vary more with respect to fluctuations in demand outside of Europe than within Europe. In 2011 and beyond, K+S expected increases in the global population and in the level of prosperity in emerging market economies, including those of Latin America and Southeast Asia. In addition to this growth leading to an expected increase in the intensity of land cultivation overall, the company also expected that consumption patterns in these countries would continue to include increases in meat consumption, which would increase the need for animal feed and therefore increase the level of demand for almost all of the company's fertilizer products (including potash) above that which would be attributable to an increase in the total level of food consumption. In 2011, K+S expected that it could increase its global sales of potash to 60 Mt compared with an estimated 57 Mt of potash sold globally by the company in 2010, but information concerning how much K+S's production of potash in Germany would increase (if at all) was not available. In 2010, the marketable production of potash in Germany was still about 400,000 t below the levels of production in 2006 and 2007, and this appeared to be far below the company's estimated potash production capacity of about 6 Mt/yr. So, marketable production of potash in the country could have increased slightly in 2011, but it is estimated to have remained about the same as in 2010 at approximately 3 Mt of K_2O content (table 1; K+S Aktiengesellschaft, 2011, p. 145–156).

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TABLE 1
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Alumina[e]	thousand metric tons	850	1,000	900	900	1,000
Aluminum hydroxide, Al_2O_3 equivalent	do.	1,393	1,388	1,395	1,154	1,485
Metal:						
Primary		515,539	551,030	605,876	291,750	402,476
Secondary		795,668	857,619	720,898	560,755	611,139
Total		1,311,207	1,408,649	1,326,774	852,505	1,013,615
Cadmium, metal, refinery, including secondary[e]		640	475 [r]	420	278	290
Cobalt, matte, including shavings and scrap		686	685	913	654	829
Copper, metal:						
Smelter:						
Primary		273,800	270,200	295,000	286,300 [r]	378,700 [p]
Secondary		266,300	273,400	293,300	247,500 [r]	212,400 [p]
Total		540,100	543,600	588,300	533,800	591,100 [p]
Refined:						
Primary		312,092	301,702	300,470	290,200	401,900 [p]
Secondary		350,246	363,815	389,300	378,745	302,400 [p]
Total		662,338	665,517	689,770	668,945	704,300 [p]
Gallium, crude[e]		12	12	12	10	12
Indium, refined[e]		10	10	10	10	10
Iron and steel:						
Ore, run of mine:[2]						
Gross weight	thousand metric tons	416	422	455	364	390
Fe content	do.	44	44	48	38	41
Metal:						
Pig iron	do.	30,362	31,149	29,111	20,104	28,560
Direct-reduced iron	do.	580	590	520	380	450
Ferroalloys:						
Ferrochromium		26,710	22,030	26,960	13,667	18,000 [e]
Other[e]		24,100 [3]	5,000	5,000	6,336 [r,4]	9,200
Steel, crude	thousand metric tons	47,224	48,550	45,833	32,671	43,830
Semimanufactures	do.	41,174	41,999	39,805	29,041	36,827
Lead, metal, refined:						
Primary		113,760	110,934	113,200	104,900	125,000 [p]
Secondary		265,190	294,147	301,900	285,700	280,400 [p]
Total		378,950	405,081	415,100	390,600	405,400 [p]
Magnesium, metal including castings		30,556	30,791	29,818	11,603 [r]	14,859
Platinum-group metals, metal, refined	kilograms	116,350	137,645	121,597	110,000 [e]	110,000 [e]
Selenium, metal[e]		720	700	250	230 [r]	250
Silicon, metal[e]		35,500	35,254 [4]	35,000	20,000	30,000
Silver, metal, refined, including secondary		1,527	1,673	1,783	1,616	1,900 [e]
Tin, alloys		6,046	6,674	6,114	5,003	5,500 [e]
Zinc, metal:[e]						
Primary		245,883 [4]	206,000	211,370 [4]	134,000	144,000
Secondary		96,683 [4]	89,000	80,910 [4]	19,000	21,000
Total		342,566 [4]	294,735 [4]	292,280 [4]	153,000	165,000
INDUSTRIAL MINERALS						
Abrasives, manufactured (corundum)		75,817	84,666	94,566	48,802	82,776
Aluminum salt slag, Al_2O_3 equivalent[e]	thousand metric tons	200	200	200	150	200
Barite, marketable (contained $BaSO_4$)		85,524	88,265	78,941	45,606	55,887
Boron compounds, manufactured, including boric acid and oxide		222,169	217,885	204,411	129,928	163,074
Bromine compounds, including oxide[e]		431 [4]	1,612 [4]	1,680 [r]	985 [r]	1,500

See footnotes at end of table.

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TABLE 1—Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Cement:						
Clinker, intended for market	thousand metric tons	24,921	26,992	25,366	23,232	22,965
Hydraulic	do.	33,630	33,382	33,581	30,441	29,894
Chalk, natural, including ground	do.	1,309	1,358	1,495	1,322	1,350 e
Clays, natural:						
Bentonite	do.	364	385	414	326	363
Ceramic and refractory clays	do.	4,285 r	4,182 r	4,229 r	3,711 r	3,978
Of which, fire clay and chamotte	do.	194	252	267	250 e	246
Kaolin, marketable	do.	3,815	3,843	3,622	4,514	4,578
Other, unspecified	do.	509	467	182	193	198
Diatomite[e]		NA r	NA r	NA r	NA r	NA
Feldspar, all uses[5]		2,982,782	3,311,523	3,616,425	3,698,134	5,202,549
Of which, feldspar for industrial uses		167,332	171,303	161,416	201,000 r,e	204,000 e
Fluorspar, acid-grade		53,009	54,359	48,519	49,962	59,086
Gypsum and anhydrite:						
Natural	thousand metric tons	1,771	1,898	2,112	1,898	1,822
Byproduct of flue-gas desulfurization[e]	do.	7,490	7,100	6,900	6,600 r	6,500
Lime, quicklime, dead-burned dolomite	do.	7,119	7,218	7,313	5,945 r	6,856
Magnesium compounds, byproduct of potash mining	do.	1,203	1,357	1,418	811	1,310
Nitrogen, N content of ammonia	do.	2,718	2,746	2,819	2,363	2,677
Peat, horticultural use	thousand cubic meters	7,995	8,269	7,629	8,364	7,759
Phosphoric acid, manufactured, P_2O_5 content		34,373	31,684	31,756	19,531	21,529
Pigments, iron oxide (including synthetic iron oxide)		242,264	240,310	251,412	209,172	233,909
Potash, K_2O content:						
Crude	thousand metric tons	4,385	4,406	4,046	2,208	3,630
Marketable	do.	3,625	3,637	3,280	1,825	3,024
Salt, NaCl content, marketable:						
Evaporated salt, including marine salt	do.	593	592	580	325	322
Industrial brines	do.	9,590	10,395	9,084	9,798	8,752
Rock salt and other brines	do.	9,663	7,819	6,169	8,816	10,602
Total	do.	19,846	18,806	15,833	18,939	19,676
Siliceous earth, marketable		53,282	51,980	52,003	42,602	49,306
Soda ash (Na_2CO_3), manufactured	thousand metric tons	2,587 r	2,595 r	2,715 r	2,291 r	2,539
Stone, sand and gravel:						
Stone, crude:						
Dimension, including partially worked	do.	219	200	207	380	425
Of which, limestone, marble, and similar stone	do.	75	63	68	NA r	NA
Crushed, not including chalk	do.	162,168	152,790	154,032	155,430	148,000 e
Dolomite and limestone, not for cement manufacture	do.	22,400	22,800	21,300	19,000	18,000
Gravel, natural:						
Construction gravel	do.	68,706	65,370	63,962	70,136 r	67,822
Crude, including flint and pebbles	do.	13,301	12,928	12,631	10,442	9,935
Other gravel, including quartzite	do.	13,326	12,639	11,911	NA r	NA
Sand, natural:						
Construction sand	do.	59,767	56,851	56,866	66,010 r	63,962
Silica sand, including glass sand and quartz sand	do.	7,703	8,382	8,186	6,453	7,234
Other, including from granite and pegmatite	do.	13,578	12,796	13,416	NA r	NA
Total sand and gravel	do.	176,381	168,966	166,972	153,041 r	148,953
Strontium carbonate, manufactured[e]	do.	80	80	80	50	70
Sulfur:						
Marketable	do.	1,114	1,093	1,030	927	832
Byproduct:						
Metallurgy	do.	2,437	2,454	2,458	2,137	2,266
Natural gas and petroleum	do.	1,686	1,637	1,709	1,623	1,447
Total	do.	4,123	4,091	4,167	3,760	3,713

See footnotes at end of table.

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TABLE 1—Continued
GERMANY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
MINERAL FUELS AND RELATED MATERIALS						
Carbon black	thousand metric tons	631	665	607	494	684
Coal:						
Anthracite and bituminous, marketable	do.	20,883 r	21,531 r	17,171 r	13,766	12,900
Lignite	do.	176,324	180,412	175,313	169,857	169,403
Coke:						
Of anthracite and bituminous coal	do.	8,372	8,432	8,246	6,771	8,241
Of lignite	do.	181	173	177	153	176
Fuel briquets:						
Of anthracite and bituminous coal	do.	96	89	--	--	--
Of lignite, including dust and dried	do.	1,662	1,328	1,631	1,959	2,024
Gas:						
Manufactured:						
Blast furnace[e]	million cubic meters	9	9	9	6	9
Coke oven	do.	958	970	969	718	951
Total[e]	do.	967	979	978	724	960
Natural:						
Gross	do.	19,667	17,966	16,449 r	15,464 r	13,584
Marketable	do.	18,443	16,884	15,377	14,380	12,571
Petroleum:[6]						
Crude	thousand 42-gallon barrels	25,800	25,300	22,400	20,500	18,400
Refinery products:						
Liquefied petroleum gas	do.	36,800	38,560	36,390	33,490	33,180
Distillate fuel oil	do.	380,000	380,000	370,000	360,000	340,000
Residual fuel oil	do.	76,200	75,300	67,500	55,600	41,600
Gasoline, including aviation	do.	210,000	200,000	200,000	200,000	180,000
Kerosene and jet fuel	do.	33,900	35,200	36,500	35,200	37,400
Naphtha	do.	90,000	86,000	87,000	75,000	72,000
Refinery gas	do.	49,100	48,300	47,800	44,500	44,500
Bitumen, bituminous mixtures, and other residues	do.	30,900	31,300	33,900	34,300	32,800
Lubricants and miscellaneous oils	do.	16,000	17,000	17,000	16,000	18,000
Petroleum coke	do.	11,000	10,600	11,500	10,900	11,500
Mineral jelly, waxes, and paraffins	do.	2,000	2,100	1,300	800	900
Other	do.	9,850	10,700	8,290	6,040	8,630
Total[e]	do.	946,000	935,000	917,000	872,000	821,000
Uranium concentrate, U_3O_8 content		77	48	--	--	9

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. [r]Revised. do. Ditto.
NA Not available. -- Zero.
[1]Table includes data available through February 6, 2012.
[2]Iron ore is used domestically as an additive in cement and other construction materials but is of too low a grade to be used in the steel industry.
[3]Estimated from reported total marketed production of ferroalloys. Source: Statistische Bundesamt, 2007, Fachserie 4, Reihe 3.1—Produzierendes Gewerbe, Produktion im Produzierenden Gewerbe, Jahr 2006: Wiesbaden, Germany, Statistische Bundesamt, April 30, p. 176.
[4]Reported figure.
[5]All uses include use as gravel for road construction, and industrial uses include use in the manufacturing of ceramics.
[6]All values were converted to barrels from those reported in metric tons according to data from Mineralölwirtschaftsverband e.V., 2011, Jahresbericht—Mineralöl-Zahlen, 2010: Berlin, Germany, Mineralölwirtschaftsverband e.V., May, p. 48 and 79, and reflect the significant digits of the conversion factors.

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TABLE 2
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Abrasives (silicon carbide)	ESK-SiC GmbH	Plant at Grefrath, Cologne	65
Alumina	Almatis GmbH (Dubai International Capital LLC)	Plant at Ludwigshafen	NA
Do.	Nabaltec AG	Plant at Schwandorf	120
Do.	Aluminium Oxid Stade GmbH (DADCO Alumina & Chemicals Ltd., 100%)	Plant at Stade	1,050
Do.	Martinswerk GmbH (Albemarle Corp., 100%)	Plant at Bergheim	350
Aluminum	Hydro Aluminium Deutschland GmbH (Norsk Hydro ASA, 100%)	Rheinwerk primary smelter at Neuss	235
Do.	Metallhüttenwerke Bruch GmbH	Secondary foundry alloy plant at Dortmund; secondary cast alloy plants at Asperg and Bad Saeckingen	110
Do.	Aleris Recycling (German Works) GmbH (Aleris International Inc., 100%)	Secondary smelters: Erftwerk at Grevenbroich, Innwerk at Toeging am Inn, and Neckarwerk at Deizisau	320
Do.	Trimet Aluminium AG	Primary smelter at Essen-Borbeck	175 e
Do.	Hamburger Aluminium-Werke GmbH (Trimet Aluminium AG, 100%)	Primary smelter at Hamburg	133
Do.	Aluminiumwerk Voerde Aluminium GmbH (Klesch & Company Ltd., 100%)	Primary smelter at Voerde, North Rhine-Westphalia	90
Aluminum, hot-rolled products	Aluminium Norf GmbH [Novelis Inc. (Hindalco Industries Ltd., 100%), 50%, and Hydro Aluminium Deutschland GmbH, 50%]	Lippenwerk at Luenen (secondary) and rolling mill at Neuss	1,500
Aluminum salt slag	Alsa Technologies GmbH (Agor AG, 100%)	Plants at Hannover, Luenen, and Toeging	380
Do.	K+S Entsorgung GmbH (K+S Aktiengesellschaft, 100%)	REKAL plant at Sigmundshall	100
Arsenic, metal metric tons	PPM Pure Metals GmbH[2] (Recylex S.A., 100%)	Plant at Langelsheim	5
Do. do.	Reinstmetalle Osterwieck GmbH (PPM Pure Metals GmbH,[2] 100%)	Plant at Osterwieck	NA
Barite	Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach, and Dreislar Mine at Medebach-Dreislar	87
Do.	Deutsche Baryt-Industrie Dr. Rudolf Alberti GmbH & Co. KG (Sachtleben Bergbau GmbH, 75%, and other private, 25%)	Wolkenhügel Mine[3] in the Harz Mountains and plant at Bad Lauterberg	50
Bentonite	Süd-Chemie AG	Mining near Gammelsdorf, Bavaria, and plants at Moosburg, Duisburg, and Heufeld	500
Do.	S&B Industrial Minerals GmbH (S&B Industrial Minerals S.A., 100%)	Mining in region between Landshut and Mainburg, Bavaria	400
Do.	do.	Stollberg plant at Oberhausen	200 e
Do.	do.	Plant at Neuss	50
Do.	Kärlicher Ton- und Schamotte-Werke Mannheim & Co. KG (KTS)	Quarry at Muelheim-Kaerlich	50
Calcium carbonate, natural, ground	Alpha Calcit Fullstoff GmbH & Co. KG	Plant at Cologne	250
Do.	Omya GmbH (Omya AG, 100%)	Plants at Burgberg, Emden, Lagerdorf, and Sohlde, and another plant near Hamburg	2,250
Do.	Eduard Merkle GmbH & Co. KG	Mine at Ulm, Blaubeuren	NA
Calcium carbonate, natural, including chalk	Vereinigte Kreidewerke Dammann KG (OMYA AG, 100%)	Quarries and plants at Laegerdorf, on Ruegen Island, and at Soehlde	500
Cement	HeidelbergCement AG	Plant at Burglengenfeld; two plants at Ennigerloh; two plants at Geseke; plants at Koenigs Wusterhausen, Leimen, Paderborn, Mainz-Weisenau, and Schelklingen; the Lengfurt plant at Triefenstein; and plant at Wetzlar	9,500 e
Do.	Dyckerhoff AG (Buzzi Unicem SpA, 88.37%, and other private, 11.63%)	Plants at Deuna, Geseke, Goellheim, Lengerich, Neuss, Neuwied, and the Amöneburg plant at Wiesbaden	7,200

See footnotes at end of table.

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TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement—Continued	CEMEX Deutschland AG (CEMEX S.A. de C.V., 100%)	Two plants at Beckum; plants at Dortmund, Duisburg, Eisenhuettenstadt, and Ruedersdorf	6,000
Do.	SCHWENK Zement KG	Plants at Allmendingen, Bernburg, Heidenheim-Mergelstetten, and Karlstadt	5,000 e
Do.	Holcim (Deutschland) AG (Holcim Ltd., 88.9%, and other private, 11.1%)	HANSA plant at Bremen, plants at Laegerdorf and Rostock, and the Höver plant at Sehnde	3,600
Do.	Lafarge Zement GmbH (Lafarge S.A., 100%)	Plants at Kall-Soetenich, Karsdorf, and Walzbachtal	3,500
Do.	Holcim (Baden-Württemberg) AG (Holcim Ltd., 100%)	Plant at Dotternhausen	1,600
Do.	TEUTONIA Zementwerk AG (HeidelbergCement AG, 94.2%, and other private, 5.8%)	Plant at Hannover	900
Do.	Märker Zement GmbH	Plants at Harburg and Lauffen	NA
Clays, including ball, ceramic, kaolinitic, and refractory clays	Sibelco Deutschland GmbH (S.C.R.- Sibelco NV, 100%)	25 quarries and 8 plants, including 2 at Ransbach and the Kannenbäckerland plant in Hoehr-Grenzhausen, Westerwald region; also including quarries and plants of Kaolin- und Tonwerke Seilitz-Loethain, Saxony region	2,000
Do.	Stephan Schmidt KG	Tonbergbau Grube Anton open pit mine, Dornburg-Langendernbach, Müllenbach and Thewald Mines, Hoehr-Grenzhausen; Wiesa-Thonberg and Cunnersdorf quarries, Kamenz-Wiesa, Westerwald	1,600
Do.	Marx Bergbau GmbH & Co. KG (Stephan Schmidt KG, 100%)	Lämmersbach and Meudt Mines, Ruppach-Goldhausen quarry, Dornburg-Langendernbach, Westerwald	350
Do.	Goerg & Schneider GmbH & Co. KG	Quarry and main plant at Boden, others at Mogendorf, Goddert, Siershahn, Wirges/Staudt, and Kettenbach/Taunus, Westerwald region; others in Saxony and Eifel regions	NA
Do.	Mittelhessische Tonbergbau GmbH (Goerg & Schneider GmbH & Co. KG, 50%, and Stephan Schmidt KG, 50%)	Quarry and plant in the Giessen/Lahn region	100
Do.	Rohstoffgesellschaft GmbH Ponholz	Mine and chamotte plant at Maxhuette-Haidoff, and Aufofweiher Mine, Bavaria	150
Do.	Adolf Gottfried Tonwerke GmbH	Quarries and plant near Grossheirath, Coburg, Bavaria	100
Do.	Erbsloh Lohrheim GmbH (Erbsloh family, 100%)	Mine at Lohrheim, Rheinland-Pfalz	30
Coal, anthracite and bituminous	Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	Augusta Victoria/Blumenthal, Prosper-Haniel, and West Mines, Ruhr region, North Rhine-Westphalia	11,000 e
Do.	do.	Saar Mine, Saar Basin, Saarland	1,500 e
Do.	do.	Ibbenbüren Mine, Steinfurt District, North Rhine-Westphalia	2,100
Coke	Deutsche Steinkohle AG (RAG Aktiengesellschaft, 100%)	Pitside coking plant at the Prosper-Haniel Mine	2,000 e
Do.	ThyssenKrupp Steel AG	Schwelgern plant at Duisburg	2,100
Do.	Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Vallourec & Mannesmann Tubes SA, 20%; Mannesmannröhren-Werke GmbH, 30%)	Plant at Duisberg-Huckingen steel complex	1,100
Copper, refined	Aurubis AG (Salzgitter AG, 25%; institutional investors, 45%; other private investors, 30%)	Primary smelter and refinery and secondary plant at Hamburg	500 e
Do.	Hüttenwerke Kayser AG (Aurubis AG, 100%)	Secondary plant and refinery at Luenen	210 e

See footnotes at end of table.

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TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Dolomite		Rheinkalk Hagen-Halden GmbH & Co KG (Lhoist NV, 100%)	Steinbruch-Donnerkuhle quarry and Hönnetal plant at Menden, and plant at Hagen-Halden	7,500
Dolomite and lime		Geomin Erzgebirgische Kalkwerke GmbH	Underground mines at Hermsdorf and Lengenfeld	NA
Feldspar		Saarfeldspatwerke H. Huppert GmbH & Co. KG	Mine at Oberthal, Gudesweiler, Saarland	60
Do.		Gottfried Feldspat GmbH	Mine at Freihung-Thansuss, Weiden, Bavaria	15
Ferrochrome		Elektrowerk Weisweiler GmbH (Kermas Ltd., 100%)	Plant at Eschweiler-Weisweiler, near Aachen	30
Fluorspar		Sachtleben Bergbau GmbH	Clara Mine in the Black Forest and plant at Wolfach	55 e
Gallium	metric tons	Geo Gallium S.A. (Mining & Chemical Products Ltd., 50%, and Recapture Metals Inc., 50%)	Ingal plant at Stade	35
Do.	do.	PPM Pure Metals GmbH[2] (Recylex S.A., 100%)	Plant at Langelsheim	NA
Graphite, manufactured		Graphit Kropfmühl AG	Plant at Kropfmuehl, Passau	20
Do.		do.	Plants at Bad Godesberg and Wedel, Holstein	8
Gypsum		VG-ORTH GmbH & Co. KG	Mine and plant at Stadtoldendorf, and plants at Osterode, Spremberg, and Witzenhausen	150
Do.		Gyproc GmbH (Lafarge S.A., 100%)	Mines and plant in Lower Saxony	110
Iron, blast furnace		ThyssenKrupp Steel AG	Two blast furnace plants at Hamborn and Schwelgern	12,000
Iron, direct reduced		ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	600 e
Iron oxide, pigments		Lanxess AG	Plant at Krefeld-Uerdingen	300
Kaolin, feldspar, and quartz		Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerke GmbH, 100%)	Mines at Caminau, Hirschau, Kemmlitz, and Schnaittenbach, Bavaria	350
Do.		Gebrüder Dorfner GmbH & Co Kaolin- und Kristallquartzsand Werk KG	Mine near Hirschau, Bavaria	NA
Lead, metal		Weser Metall GmbH (Recylex S.A., 100%)	Primary and secondary smelter and refinery at Nordenhan	145
Do.		Berzelius Metall GmbH [Eco-Bat Technologies Ltd. (Quexco Inc., 100%), 100%]	Secondary smelters at Braubach am Rhein and Freiberg/Sachsen	200
Do.		do.	Primary smelter at Stolberg	150
Do.		Muldenhütten Recycling- und Umwelttechnik GmbH	Secondary smelter at Freiburg, Saxony	55
Do.		Aurubis AG	Refinery at Hamburg	50
Lignite		RWE Power AG (RWE Aktiengesellschaft, 100%)	Open pit mines in Rhenish mining area: Bergheim, Garzweiler, Inden, and Hambach	105,000
Do.		Vattenfall Europe Mining AG	Jänschwalde-Cottbus-Nord, Nochten, and Welzow-Süd Mines, Lausatian mining area	60,000
Do.		Mitteldeutsche Braunkohlengesellschaft AG	Profen and Vereinigtes Schleenhain Mines	25,000
Limestone		Harz-Kalk GmbH	Quarry at Ruebeland	2,000 e
Do.		Kalkwerk Bad Kösen GmbH	Quarry at Bad Koesen	2,000 e
Do.		Fels-Werke GmbH	Quarry at Kaltes Tal	2,000 e
Do.		Schäfer Kalk GmbH & Co KG	Plants at Hahnstaetten, Steeden, Stromberg, and Grevenbrueck	3,000
Do.		Rheinkalk GmbH & Co KG (Lhoist NV, 100%)	Flandersbach quarry and plant at Wuelfrath	7,500
Magnesium, metal, secondary		Norsk Hydro Magnesiumgesellschaft GmbH (Norsk Hydro ASA, 100%)	Plant at Bottrop	26
Do.		Aleris Recycling (German Works) GmbH (Aleris International Inc., 100%)	Plant at Toeging am Inn	15
Do.		do.	Plant at Deizisau	50
Natural gas	million cubic meters	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%), including any fields owned or operated by BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Goldenstedt, Hemmelte, Klosterseelte, Söhlingen, and other fields in Lower Saxony	14,000 e
Do.	do.	RWE-Dea AG (RWE Power AG, 100%)	Bötersen, Hemsbünde, Völkersen, and smaller fields in Lower Saxony; and Inzenham-West Field, Bavaria	3,000 e
Do.	do.	Gaz de France Produktion Exploration Deutschland GmbH (Gaz de France S.A., 100%)	Salzwedel Field, Saxony-Anhalt; Schneeren and smaller fields in Lower Saxony	1,500 e

See footnotes at end of table.

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TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Natural gas—Continued	million cubic meters	Wintershall Holding AG (BASF AG, 100%)	A6/B4 blocks offshore of Schleswig Holstein; and smaller fields in Lower Saxony	1,200 e
Do.	do.	EEG-Erdgas Erdöl GmbH (Gaz de France S.A., 100%)	Muehlhausen and other fields in Thüringen	50 e
Petroleum:				
Crude	thousand 42-gallon barrels	Wintershall Holding AG (BASF AG, 100%), 50%, and RWE-Dea AG (RWE Power AG, 100%), 50%	Mittelplate-Dieksand field, in tidal flats of the North Sea, offshore of Schleswig-Holstein	15,500
Do.	do.	Wintershall Holding AG (BASF AG, 100%)	A6/B4 blocks offshore of Schleswig Holstein; Aitingen field, Bavaria; Emlichheim field, Lower Saxony; and smaller fields in Lower Saxony and Rheinland-Pfalz	2,000 e
Do.	do.	Gaz de France Produktion Exploration Deutschland GmbH (Gaz de France S.A., 100%)	Bramberge, Ruehlertwist, Scheerhorn, and Ringe fields in Lower Saxony; and smaller fields in the States of Bavaria, Hamburg, Lower Saxony, and Mecklenburg-Western Pomerania	3,500 e
Do.	do.	Mobil Erdgas-Erdöl GmbH (Exxon Mobil Corp., 100%)	Barenburg, Ruehme, and Lueben fields, Lower Saxony; and smaller fields in the States of Lower Saxony and Rheinland-Pfalz	1,800 e
Do.	do.	BEB Erdgas und Erdöl GmbH (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Georgsdorf, Meppen, and Ruehlermoor fields, west of the Ems River (Emsland), Lower Saxony	3,000 e
Refined	do.	Deutsche Shell AG	Refineries at Godorf, Hamburg, and Grasbrook	256,000 e
Do.	do.	Esso Deutschland GmbH (ExxonMobil Central Europe Holding GmbH, 100%)	Refineries at Karlsruhe and Ingolstadt	245,000 e
Do.	do.	Ruhr Oel GmbH (Petróleos de Venezuela S.A., 50%, and BP Gelsenkirchen GmbH, 50%)	Refinery at Gelsenkirchen	215,500 e
Do.	do.	BAYERNOIL Raffineriegesellschaft mbH (OMV AG, 45%; Ruhr Oel GmbH, 25%; AGIP Deutschland GmbH, 20%; Deutsche BP AG, 10%)	Refinery at Neustadt-Donau	145,000 e
Potash, K_2O content		K+S Kali GmbH (K+S Aktiengesellschaft, 100%)	Mines at Hattorf, Neuhof-Ellers, Niedersachen-Riedel, Sigmundshall, Unterbreizbach, Wintershall, and Zielitz	6,000
Salt (evaporated and rock)		esco - european salt company GmbH & Co. KG [K+S Salz GmbH (K+S Aktiengesellschaft, 100%)]	Bernburg Mine and evaporated salt works; Borth Mine and evaporated salt works near Wesel; and the Braunschweig-Lüneburg Mine near Helmstedt	5,300 e
Do.		Wacker Chemie AG	Stetten rock salt mine near Haigerloch	500
Do.		Südsalz GmbH (Südwestdeutsche Salzwerke AG, 90%, and Vereinigte Schweizerische Rheinsalinen AG, 10%)	Rock salt mine at Berchtesgaden and evaporated salt works at Bad Reichenhall, Bavaria; and mine at Heilbronn and evaporated salt works at Bad Friedrichshall-Kochendorf, Heilbronn district, State of Baden-Württemburg	5,000
Do.		Saline Luisenhall GmbH	Evaporated salt works at Göttingen	NA
Selenium, metal	metric tons	Retorte GmbH (Aurubis AG, 100%)	Plant at Röthenbach	2,500
Silica sand (industrial sand)		Quarzwerke GmbH	Mines and plants at Frechen, Gambach, Haltern, Hohenbocka, and Weferlingen	4,500 e
Do.		Amberger Kaolinwerke GmbH—Eduard Kick GmbH & Co. KG (Quarzwerke GmbH, 100%)	Mines and plants at Hirschau and Schnaittenbach	850
Siliceous earth, silica		Hoffmann Mineral and Co. KG	Mine and plant near Neuburg	55
Silicon, metal	metric tons	RW Silicium GmbH (Graphit Kropfmühl AG, 100%)	Four electric arc furnaces in plant at Pocking	27,500
Soda ash		Solvay S.A.	Plant at Rheinberg, Germany	NA
Steel, crude		ThyssenKrupp Steel AG (ThyssenKrupp AG, 100%)	Bruckhausen and Beeckerwerth plants, near Duisburg	12,000
Do.		Salzgitter AG	Plants at Peine and Salzgitter	6,400 e
Do.		Hüttenwerke Krupp Mannesmann GmbH (ThyssenKrupp Steel AG, 50%; Salzgitter Mannesmann GmbH, 30%; Vallourec & Mannesmann Tubes SA, 20%)	Plant at Duisberg-Huckingen	5,600

See footnotes at end of table.

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TABLE 2—Continued
GERMANY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Steel, crude—Continued	ArcelorMittal Bremen GmbH (ArcelorMittal, 99.88%, and other private, 0.12%)	Plant at Bremen	4,000
Do.	Saarstahl AG (Struktur-Holding-Stahl GmbH & Co KG, 74.9%, and Dillinger Hüttenwerke AG, 25.1%)	Plants at Burbach, Neunkirchen, and Voelklingen	3,000
Do.	AG der Dillinger Hüttenwerke (Saarstahl AG, 33.75%; ArcelorMittal, 30.08%; Struktur-Holding-Stahl GmbH & Co KG, 26.17%; Dillinger Hütte und Saarstahl mbH, 10%; other, 4.72%)	Plant at Dillingen	2,800
Do.	ArcelorMittal Eisenhüttenstadt GmbH (ArcelorMittal, 100%)	Plant at Eisenhuettenstadt	2,700
Do.	Badische Stahlwerke GmbH	Plant at Kehl	2,300 e
Do.	Brandenburger Elektrostahlwerk GmbH (RIVA FIRE S.p.A, 100%)	Plant at Brandenburg	1,700 e
Do.	ThyssenKrupp Nirosta (ThyssenKrupp Steel AG, 100%)	Plants at Bochum and Krefeld	1,600 e
Do.	ArcelorMittal Ruhrort GmbH (ArcelorMittal, 100%)	Plant at Duisburg	1,500 e
Do.	Georgsmarienhütte GmbH	Plants at Bous, Georgsmarienhuette, and Groeditz	1,300 e
Do.	Stahlwerk Thüringen GmbH (Alfonso Gallardo S.A., 100%)	Plant at Unterwellenborn	1,100 e
Do.	Deutsche Edelstahlwerke GmbH	Plants at Siegen and Witten	1,100 e
Do.	Lech-Stahlwerke GmbH (Max Aicher GmbH & Co. KG, 100%)	Plant at Herbertshofen	1,100 e
Do.	ArcelorMittal Hamburg GmbH (ArcelorMittal, 100%)	Plant at Hamburg	1,100 e
Do.	Hennigsdorfer Elektrostahlwerk GmbH (RIVA FIRE S.p.A, 100%)	Plant at Hennigsdorf	1,000 e
Do.	Elbe-Stahlwerke Feralpi GmbH (Feralpi Siderurgica S.p.A., 100%)	Plant at Riesa	950 e
Strontium carbonate	Solvay & CPC Barium Strontium GmbH & Co. KG (Solvay S.A., 75%, and Chemical Products Corp., 25%)	Plant at Bad Hoenningen, near Hannover	95
Sulfur	Norddeutsche Erdgas-Aufbereitungs GmbH NEAG [BEB Erdgas und Erdöl GmbH (ExxonMobil Production Deutschland GmbH, 50%, and Royal Dutch Shell plc, 50%), 100%]	Natural gas desulfurization plants at Grossenkneten and Voigtei (near Nienburg-Weser), Lower Saxony	600
Zeolites	Hans G. Hauri Mineralstoffwerk GmbH	Mine and plant at Boetzingen, near Freiburg	NA
Zinc, metal	Metaleurop Zinkbetrieb GmbH & Co. KG (Xstrata plc, 100%)	Nordenham Smelter, near Bremerhaven	160
Do.	Ruhr-Zink GmbH (GEA Group AG, 100%)	Refinery at Datteln[4]	140
Zinc, oxides	Harz Metall GmbH (Recylex S.A., 100%)	Waëlz rotary kilns at Oker-Goslar	80 e
Do.	Norzinco GmbH (Recylex S.A., 100%)	Secondary plant at Oker-Goslar	35 e

eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Table includes data available through December 31, 2011.

[2]In addition to producing arsenic as a byproduct of chemical manufacturing and gallium as a byproduct of aluminum production, PPM Pure Metals GmbH produces small quantities of germanium as a byproduct of processing imported ores and concentrates and small quantities of indium and tellurium as byproducts of zinc metal production by PPM's parent company, Recylex S.A.

[3]Closed in 2007.

[4]Closed at the end of 2008, and approximately 40% of total production of zinc metal at this refinery was from secondary materials.

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The Mineral Industry of Greece

By Harold R. Newman

Mining has been a part of Greek civilization since before 1,000 B.C when Greeks first began extracting industrial minerals and metals for use. In 2010, the mining industry was regulated by the Mining Code, Legislative Decree 210/1973, as amended by a number of laws and ordinances on technical and procedural issues, such as law No. 669/1977 on the exploitation of ornamental rocks and industrial minerals; law No. 428/84 as amended by law No. 2115/93 on the exploitation of aggregates; and the Regulation on Mining and Quarrying Activities including the Health and Safety Regulation on Mining and Quarrying. Greece's mineral industry was also subject to the European Union (EU) Environmental Impact Assessment Directives, and the EU Mining Waste Directive 2006/21/EC (Hellenic Republic Ministry of Environment, Energy, and Climate Change, 2010, p. 16).

Geologic studies in Greece were done primarily by the Institute of Geology and Mining Exploration (IGME). The IGME studies provide general information on deposit size and location and the quality of various minerals. Most exploration activity was focused on northern Greece, which was thought to contain a significant amount of exploitable minerals (Institute of Geology and Mineral Exploration, 2010).

Major fiscal problems that began to be evident in 2009 continued in 2010 as lower economic growth and higher interest rates resulted in a financial crisis in the country. In 2010, the debate was centered around whether the Government would default on its sovereign debt. In May, the Greek Parliament, euro area countries, and the International Monetary Fund approved a $145 billion financial bailout package in return for which Greece was to implement strict fiscal austerity measures and structural reforms (U.S. Department of State, 2012). The Government stated that the austerity measures would be implemented to reduce the deficit to 3% of the gross domestic product (GDP) by the end of 2013 (down from 12.7% at yearend 2009) and control the national debt, which was at 113% of the GDP in 2010. The Stability and Convergence Pact, also known as the Maastricht Treaty of 1992, called for the debt-to-GDP ratio not to exceed 60%. The Government stated that, given time, it would succeed in getting its fiscal affairs in order (Mizan, 2010).

Minerals in the National Economy

The mineral industry produced and (or) processed industrial minerals, metals, and mineral fuels. Companies in Greece exported about two-thirds of their production. During the past 20 years, the significance of the mineral industry to the Greek economy had gradually lessened, and by 2010, its financial effect on the economy was small. From the standpoint of domestic economic development, however, mineral industry activities have traditionally been an important segment of Greece's industry. Most of the Greek companies that dealt in metal fabrication, mining of minerals, and refined metal production, or processing were well established and had a strong export orientation. Greek merchandise exports in 2010 totaled $21.4 billion, of which fuels and mining output accounted for $20.7 million. Imports totaled $63.2 billion, of which fuels and mining output accounted for $26.9 million (World Trade Organization, 2011).

Production

Greece was a global supplier of several key industrial minerals and a significant producer of bauxite, caustic-calcined magnesium, mined nickel, and screened perlite in the EU. Production of mineral commodities in Greece was closely tied to the export market. In 2010, Greece was the world's leading producer of perlite (32%) and the world's fourth ranked producer of pumice (7%) after Turkey, Italy, and Iran. It also was estimated to have produced about 9% of the world's bentonite and 1% of the world's bauxite. Bauxite, which is the raw material needed for aluminum production, and lignite, which is used as a fuel in powerplants, were the two most abundant minerals in Greece. In terms of the value of production, bauxite was the most important of Greece's mineral commodities (Bolen, 2011; Bray, 2011; Virta, 2011).

The country's mineral production levels were more or less the same as in 2010 except for increases in the production of alumina and mined nickel and decreases in the production of crude steel production and petroleum (table 1). These changes were mostly in response to the changes in demand and to the country's and companies' economic situations.

Structure of the Mineral Industry

The major mineral commodities and the companies that produced them in 2010 are listed in table 2. Nearly all companies were privately owned; Government ownership was limited to the mineral fuels sector.

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—In 2010, Greece was a leading bauxite producer in the EU, and S&B Industrial Minerals S.A. (S&B) controlled most of the significant bauxite reserves in Greece. The major bauxite deposits are located in central Greece within the Parnassos-Ghiona geotectonic zone and on Evoia Island. Greece's estimated 100 million metric tons (Mt) of bauxite reserves were of boehmitic and diasporic type (S&B Industrial Minerals S.A., 2010).

Delphi-Distomon S.A. was the second ranked bauxite producer in Greece after S&B and had an output of 800,000 metric tons per year (t/yr) exclusively from underground sites. The company's

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mines were located in the areas of Amfissa and Distomon (Delphi-Distomon S.A., 2010).

Aluminium de Grèce S.A. produced alumina from bauxite and aluminum from alumina through electrolysis. The company's industrial plant had the capacity to produce 800,000 t/yr of alumina and 165,000 t/yr of aluminum. The aluminum was marketed to automobile manufacturers and manufacturers of building materials and packaging (Aluminium de Grèce S.A., 2010).

Gold.—Cape Lambert Resources Ltd. of Australia's Sappes gold project is located in northeastern Greece about 30 km northwest of the port city of Alexandroupolis. The Sappes project is located on a 20.1-square-kilometer lease and included the development of the underground Viper deposit and an open pit at the St. Demetrios deposit. A feasibility study in 2006 proposed production of about 2,835 kilograms per year of gold in dore and flotation concentrate during a period of 5 years. The estimated total resource at the Viper deposit was 0.99 Mt at a grade of 21.4 grams per metric ton (g/t) gold (Cape Lambert Resources Ltd., 2010).

Hellas Gold S.A., which was a subsidiary of European Goldfields Ltd. of Canada, owned three gold and base-metal deposits in northern Greece. These were the Olympias deposit, which was a polymetallic deposit that contained gold, lead, silver, and zinc; the Skouries gold deposit; and the Stratoni deposit, which was a polymetallic deposit. These deposits were part of the Kassandra property in northern Greece. Hellas Gold completed selling gold concentrates from an existing stockpile at Olympias and had applied for the relevant permits to re-treat tailings and resume underground mining at the property as soon as the necessary permits are awarded (European Goldfields Ltd., 2010a).

The Skouries gold project is located 35 kilometers (km) from Stratoni in northern Greece and was a typical porphyry deposit that formed a nearly vertical pipe. The project was in the basic engineering and construction stage. Skouries would employ a simple metallurgical process and would produce clean concentrate using flotation as well as dore from the gravity circuit. The mine's estimated proven reserves were 77.5 Mt grading 0.87 g/t gold, and its estimated probable reserves were 68.7 Mt grading 0.83 g/t gold (European Goldfields Ltd., 2010b).

Lead, Silver, and Zinc.—The tectonic structure of Greece consists of elongated tecto-magnetic terrains that represent successive episodes of subduction. One such terrain in northern Greece is the Serbo-Macedonian massif, which hosts the Stratoni deposit. The Stratoni mineralization was classified as lead-silver-zinc carbonate replacement type mineralization, with galena, pyrite, and sphalerite as the main ore minerals. The Stratoni Mine was a producing lead-silver-zinc operation. Resources at the Stratoni Mine were contained within the Mavres Petres ore body, which had estimated proven and possible reserves of 2.3 Mt grading 9.9% zinc, 7.7% lead, and 203 g/t silver. The mine, which had an expected life of 10 years from the commencement of mining in 2005, produced a lead-silver concentrate and a zinc concentrate by a conventional underground drift-and-fill method. This method was ideally suited to this high-grade ore body as it minimizes dilution, maximizes recovery of ore, and allows the mine headings to change direction with the changing ore geometry (European Goldfields Ltd., 2010c).

Nickel.—Nickel laterite mineral resources were estimated to be about 250 Mt and were spread across three areas: central Euboea, Neo Kokkino, and northern Greece in the area of Kastona. Larco G.M.M. S.A. (Larco), which was a leading producer of nickel in Europe and the only European user of domestic nickel ores, mined open pit and underground sedimentary-type nickel laterite at its Agios and Evia Mines near Larymna, and smelted the material at its plant in Larymna (Larco G.M.M. S.A., 2010).

Industrial Minerals

Cement.—Titan Cement Co. S.A. was a significant cement producer. Titan's four plants produced a total of about 6 Mt/yr and commanded a 40% market share. Titan was engaged in an extensive investment program and had become a diversified and vertically integrated company as a result of adding ready-mix concrete production and cement products, including cement blocks and mortar, to its production capabilities (Titan Cement Company S.A., 2010).

Magnesium Compounds.—Grecian Magnesite S.A. announced that it had begun reprocessing old stockpiles in 2010 with the installation of a new secondary processing line. The secondary mineral processing line for the beneficiation of the fines [4 millimeter (mm) to 18 mm run-of-mill material] allowed the use of the old stockpiles and provided low-cost raw material for the production of caustic calcined magnesia, mainly for agricultural and construction applications (Industrial Minerals, 2010).

Mineral Fuels

Coal.—In 2010, the predominant fuel used in electricity generation in Greece was lignite, and Public Power Corp. (PPC) was Greece's major producer of lignite. PPC's leading lignite mines in Megaloplis and Ptolemais provided lignite for power generation. PPC's lignite-powered powerplants represented 42% of the country's total installed capacity and generated about 56% of the country's electrical energy. Greece had an estimated 3,900 Mt of coal reserves, or 0.47% of the world's total reserves. In terms of lignite production, Greece ranked second in the EU and sixth worldwide (MBendi Information (Pty) Services, 2010).

Natural Gas.—Production of natural gas was negligible owing to Greece's limited natural gas reserves. Its Mediterranean location, however, made it conveniently close to several important producing regions, such as the Caspian Sea area, the Middle East, and North Africa, which could help meet its energy requirements.

Petroleum.—Energean Oil & Gas S.A. (formerly known as Aegean Energy S.A.), was expanding its investments in petroleum exploration projects offshore Greece. Energean was the only natural gas and petroleum exploration and production company in Greece. The company was operating in the South Kavala natural gas field and the Prinos offshore petroleum

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field, where it held a 100% interest. At yearend 2010, drilling equipment had arrived at the Prinos field, and drilling was scheduled for the second half of 2011. Energean estimated that the Prinos Epsilon field contained about 50 million barrels of recoverable petroleum. Energean also reported that scientific and economic conferences had presented figures that estimated about 22 billion barrels (Gbbl) in the Ionian Sea off the coast of western Greece and about 4 Gbbl in the northern Aegean Sea. It was estimated that about 10% of these reserves could be exploited. Exploration for petroleum in the southern Aegean Sea and the Cretan Sea had not yet been done as of 2010 (Michaletos, 2010).

Outlook

Greece's economic outlook for 2011 is not expected to improve greatly, even though the Government is expected to continue its efforts to reform the economy and address the serious debt issue. Greece is expected to remain a major supplier of bauxite in the international market. The industrial minerals sector will continue to be a small but important part of the country's revenue earnings. Development of several mineral resource projects in the northern part of Greece are likely to continue, along with mineral fuel exploration efforts offshore Greece. The Government is expected to be involved in planning investment programs to improve the existing installations and to lower operating costs to encourage development in the mineral resource sector.

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TABLE 1

GREECE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum:						
Bauxite		2,162,900	2,125,900	2,176,300	1,935,000	2,000,000
Alumina, Al_2O_3		775,000 [e]	761,746 [r]	771,769	718,797	725,000
Metal:						
Primary		164,800	166,300	162,339 [r]	134,737	130,000
Secondary[e]		3,000	3,000	3,000	3,000	3,000
Chromite, ore, crude		1,450 [3]	1,400	1,400	1,400	1,400
Iron and steel:						
Iron ore and concentrate, nickeliferous, Fe content[e]		575,000	575,000	570,000	560,000	560,000
Metal:						
Steel, crude	thousand metric tons	2,416	2,554	2,477	2,082	1,839 [3]
Ferroalloys, ferronickel, gross weight		100,000 [e]	93,300 [r]	83,200 [r]	41,300 [r]	42,000
Lead:[e]						
Mine output, Pb content		10,500	15,000	23,314 [3]	17,027 [3]	18,000
Metal, secondary	thousand metric tons	6	11	11	10	10
Manganese:[e]						
Ore, crude:						
Gross weight		100	100	100	100	100
Mn content		15	15	15	15	15
Concentrate:						
Gross weight		20	20	20	20	20
Mn content		15	15	15	15	15
Nickel:						
Ore, Ni content of nickeliferous iron ore		21,670	21,200	16,640	10,203 [r]	13,837 [3]
Metal, Ni content of ferronickel		17,700 [3]	18,700	18,600	8,269 [r, 3]	18,500
Silver, mine output, Ag content	kilograms	25,900 [3]	38,300	35,500	30,177 [r, 3]	32,000
Zinc, mine output, Zn content by analysis		16,414	20,700 [r]	20,300 [e]	18,126	19,967 [3]
INDUSTRIAL MINERALS						
Abrasives, natural emery[e]		8,000	8,000	8,000	8,000	8,000
Aggregates	thousand metric tons	8,000	7,500	8,500	6,500	6,500
Cement, hydraulic		10,852,000 [r]	12,035,077 [r]	11,361,397 [r]	8,649,322 [r]	9,000,000
Clays:						
Bentonite, crude, includes attapulgite and sepiolite		1,125,000	1,200,000 [r]	1,389,800 [r]	926,186 [r]	1,000,000
Kaolin, crude		50,000	40,000	4,360	--	--
Feldspar[e]		100,000	100,000	62,000 [3]	28,617 [3]	30,000
Gypsum and anhydrite[e]		850,000 [r, 3]	836,967 [r, 3]	865,000	730,000	750,000
Magnesite:[e]						
Crude		463,277 [3]	351,414 [3]	361,165 [r, 3]	380,834 [r, 3]	400,000
Dead-burned		58,000	56,000	58,000	48,000	48,000
Caustic-calcined		70,000	70,000	70,000	70,000	70,000
Huntite, crude		18,000	18,000	19,600 [3]	10,652 [3]	12,000
Nitrogen, N content of ammonia[e]		130,000	130,000	130,000	130,000	130,000
Perlite:[e]						
Crude		1,100,000	1,100,000	1,100,000	862,935 [r, 3]	900,000
Screened		550,000	550,000	500,000	398,451 [3]	400,000
Pozzolan, Santorin earth[e]		1,500,000	1,400,000	1,059,000 [3]	830,000 [3]	850,000
Pumice		850,000	900,000	828,000	381,000 [3]	400,000
Salt, all types		195,000	195,000	220,000	189,000 [3]	200,000
Silica[e]		125,000	100,000	64,521 [3]	37,905 [3]	40,000
Sodium compounds:[e]						
Carbonate		750	750	750	750	750
Sulfate		5,000	5,000	5,000	5,000	5,000
Stone:[e]						
Dolomite		60,000	60,000	60,000	60,000	60,000
Marble	cubic meters	250,000	250,000	347,526 [3]	255,516 [3]	250,000
Flysch		95,000	95,000	95,000	95,000	95,000
Quartz, microcrystalline	thousand metric tons	150	150	150	150	150

See footnotes at end of table.

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TABLE 1—Continued

GREECE: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
INDUSTRIAL MINERALS—Continued						
Sulfur:[e]						
S content of mixed sulfide ore		250,000	250,000	264,299 [3]	225,054 [3]	230,000
Byproduct, natural gas and petroleum		160,000	165,000 [r]	120,000 [r]	142,000 [r]	140,000
Talc and steatite		250	200	200	200	200
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Lignite	thousand metric tons	64,520	73,092	64,521	62,730	64,000
Lignite briquets[e]		36,000	36,000	36,000	36,000	36,000
Gas:[e]						
Manufactured, gasworks	million cubic meters	15	15	15	15	15
Natural	do.	16	15	14	11	11
Natural gas plant liquids	thousand 42-gallon barrels	140	140	140	140	140
Petroleum:						
Crude	do.	668	660	478	628	600
Refinery products:[e]						
Liquefied petroleum gas	do.	7,575 [3]	8,000	8,000	8,000	8,000
Gasoline	do.	32,000	32,000	32,000	32,000	32,000
Naphtha	do.	8,400	8,400	8,400	8,400	8,400
Mineral jelly and wax	do.	20	20	20	20	20
Jet fuel	do.	16,000	16,000	16,000	16,000	16,000
Kerosene	do.	130	130	130	130	130
Distillate fuel oil	do.	42,000	42,000	42,000	42,000	42,000
Refinery gas	do.	4,800	4,800	4,800	4,800	4,800
Lubricants	do.	1,200	1,200	1,200	1,200	1,200
Residual fuel oil	do.	50,000	50,000	50,000	50,000	50,000
Bitumen	do.	3,000	3,000	3,000	3,000	3,000
Petroleum coke	do.	1,000	1,000	1,000	1,000	1,000
Other	do.	900	900	900	900	900
Refinery fuel and losses	do.	7,500	7,500	7,500	7,500	7,500
Total	do.	175,000	175,000	175,000	175,000	175,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through February 1, 2012.

[2]In addition to the commodities listed, other crude construction materials are produced, but available information is inadequate to make a reliable estimate of output.

[3]Reported figure.

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TABLE 2
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina, Al_2O_3	Aluminium de Grèce S.A (AdG) (Mytilineos Holdings S.A., 53%)	Agios Nikolaos, Boeotia area	800
Aluminum	do.	do.	165
Asbestos	Hellenic Mineral Mining Co. S.A.	Mines at Zidani, near Kozani (closed)	100
Barite, $BaSO_4$	S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Milos Island (closed)	1
Bauxite	do.	Mines at Amfissa and Distomon, plants at Phocis and Itea	2,000
Do.	Delphi-Distomon S.A. (Mytilineos Holdings S.A.)	Mines at Amfissa and Distomon	800
Do.	Hellenic Mining Enterprises, S.A.	Mines at Aga Marina, Lamia	500
Bentonite:			
Crude	Mediterranean Bentonite Co. S.A. (Industria Chemica Mineraria S.p.A.)	Surface mines on Milos Island	20
Do.	Mykobar Mining Co. S.A. (Silver & Baryte Ores Mining Co. S.A.)	Mines at Adamas, Milos Island	300
Do.	do.	Plants at Adamas, Milos Island	200
Do.	S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Mines at Adamas, Milos Island	600
Processed	do.	Plant at Voudia Bay, Milos Island	400
Cement	Halkis Cement Co. S.A. (Lafarge Group)	Micro-Vathi plant, west-central Euboea Island	3,000
Do.	Halyps Cement S.A. (Ciments Français Group)	Paralia Aspropyrgos plant, Athens	800
Do.	Heracles General Cement S.A. (Lafarge Group)	Plants at Halkis Evia, Milaki Evia, and Volos	9,600
Do.	Titan Cement Co. S.A.	Elefsis plant, Athens area	400
Do.	do.	Kamari plant, Boeotia	2,600
Do.	do.	Patras plant, northern Peloponnesus	1,900
Do.		Salonica plant, Salonica	1,650
Chromite	Financial-Mining-Industrial and Shipping Corp. (FIMISCO)	Tsingeli Mine, Volos	25
Ferroalloys, ferronickel, Ni content	Larco G.M.M. S.A.	Larymna metallurgical plant	25
Gold, Au in concentrate kilograms	Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines [Olympias (closed) and Stratoni]	5,000
Gypsum	Lava Mining and Quarrying Co. S.A.	Altsi, Crete Island	500
Do.	Titan Cement Co. S.A.	do.	280
Hunite/hydromagnesite	Microfine S.A.	Mines in Kozani Basin	100
Lead, mine, Pb in concentrate	Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines [Olympias (closed) and Stratoni, northeastern Chalkidike]	30
Lignite	Public Power Corp. (PPC) (Government)	Aliveri Mine, Euboea Island	420
Do.	do.	Megalopolis Mine, central Peloponnesus	7,000
Do.	do.	Ptolemais Mine, near Kozani	28,000
Magnesite, concentrate	Grecian Magnesite S.A. (GM)	Mine and plant at Gerakini and Kalives, Chalkidiki, northern Greece	200
Manganese, battery-grade MnO_2	Eleusis Bauxite Mines Mining, Industrial and Shipping S.A. [National Bank of Greece (OAE)]	Nevrokopi, Drama	10
Marble, slab and tile cubic meters	Aghia Marina Marble Ltd.	Various areas of northern Greece	NA
Do. do.	Michelakis Marble S.A.	Kavala	NA
Do. do.	Gourlis Group	Quarries at Levadia, Neurokopi, and Tiseo	NA
Natural gas million cubic meters per day	Public Petroleum Corp.(PPC) (Government)	Prinos offshore gasfield and oilfield, east of Thasos Island	125
Nickel, ore	Larco G.M.M. S.A.	Agios Ioannis Mine, near Larymna	700
Do.	do.	Evia Mine, near Larymna	1,500
Nitrogen, N content of ammonia	Phosphoric Fertilizers S.A.	Nea Karvali	150

See footnotes at end of table.

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TABLE 2—Continued
GREECE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Perlite		S&B Industrial Minerals, S.A. (Eliopoulos-Kyriakopoulos Group)	Mines on Kos and Milos Islands; plant at Pireaus	650
Do.		Otavi Minen Hellas S.A. (Otavi Minen AG)	Milos Island	150
Do.		Bouras Co.	Kos Island	50
Petroleum, refined	42-gallon barrels per day	Hellenic Aspropyrgos Refinery S.A.	Aspropyrgos	95,000
Do.	do.	Motor Oil (Hellas) Corinth Refineries S.A.	Aghii Theodori, Corinth	170,000
Do.	do.	Petrola Hellas S.A.	Eleusis	100,000
Do.	do.	Thessaloniki Refining Co. A.E.	Thessaloniki	76,000
Pozzolan (Santorin earth)		Lava Mining and Quarrying Co. (Heracles General Cement Co.)	Xylokeratia, Milos Island	600
Do.		Titan Cement Co. S.A.	do.	300
Pumice		Lava Mining and Quarrying Co. (Heracles General Cement Co.)	Yali Island	1,000
Quartz (microcrystalline)		do.	Adamas, Milos Island	150
Steel, crude		Halyvourgia Thessalias S.A. (Manessis Bros. and Voyatzis S.A., 65%, and National Investment Bank for Industrial Development, 35%)	Steelworks at Volos	1,500
Do.		Sidenor Steel Products Manufacturing S.A.	Steelworks at Thessaaloniki and Almyros	2,800
Do.		Halyvourgiki, Inc.	Steelworks at Eleusis	1,200
Do.		Hellenic Steel Co.	Steelworks at Thessaloniki	1,000
Do.		Corinth Pipeworks S.A (CPW)	Steelworks at Thisvi	700
Zeolite		S&B Industrial Minerals, S.A. (Eliopoulos - Kyriakopoulos Group)	Mine at Pendalofos; plant at Ritsona	100
Zinc, mine, Zn in concentrate		Hellas Gold S.A. (European Goldfields Ltd.)	Kassandra Mines (Olympias and Stratoni), northeastern Chalkidike	30

Do., do. Ditto. NA Not available.

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The Mineral Industry of Hungary

By Alberto Alexander Perez

Hungary was a modest producer of minerals, and mining and mineral processing activities made up only a small part of the country's economy. In 2010, Hungary's gross domestic product (GDP) increased by 1.2% compared with the GDP in 2009. The output of its mining and quarrying sector, however, decreased by 19.8% compared with the volume of production in 2009. Petroleum, petroleum products, and related materials accounted for about 5.6% of the value of all imports, and natural and manufactured gas accounted for about 3.8% of the total value of imports. Hungary was a participant in both the South Stream and the Nabucco natural gas pipeline development projects, which will transport gas from Russia to Austria and from Turkey to Austria, respectively (Hungarian Central Statistical Office, 2011, p. 180; U.S. Central Intelligence Agency, 2011).

Production

The mineral commodities for which production increased notably in 2010 were pig iron (by 26.2%), crude steel (19.8%), bauxite (16%), and alumina (15%). Those for which there were notable decreases in production included bentonite (by 33.3%) and gypsum (16.7%). The increases in production can be attributed to the nascent recovery that some industries experienced in 2010, such as the automobile manufacturing industry. Ukrainian steel producer ISD, which owned ISD Dunaferr Co. Ltd. in Hungary, was acquired by a private group of investors and financed by the Russian bank Vnesheconombank. The group's 51% stake was purchased for about $1 billion on December 31, 2009, and the other 49% was acquired during 2010 (table 1; Metal Bulletin, 2010).

Construction activity decreased by 10.1% compared with that of the previous year, of which construction of infrastructure decreased by 15.2% and construction of buildings decreased by 5.2%. Nostra Cement, which was a subsidiary of Strabag SE, was to complete construction of a new cement plant at Kiralyegyhaza in 2011; the plant would have a production capacity of 750,000 metric tons per year of clinker. Production was expected to begin in June 2011 (Budapest Business Journal, 2011; Cembureau, 2011, p. 9).

Structure of the Mineral Industry

Table 2 is a list of the major mineral industry facilities.

Outlook

Hungary will most likely remain a small producer of mineral products. The trade of mineral fuels is expected to remain a significant component of Hungary's trade balance.

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TABLE 1

HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Bauxite, gross weight	thousand metric tons	538	546	511	317	365
Alumina, gross weight, calcined basis	do.	301	301	299	185	214
Aluminum:						
Primary		1,400	--	--	--	--
Secondary[e]		50,000	50,000	50,000	50,000	50,000
Total		51,400	50,000	50,000	50,000	50,000
Gallium	kilograms	6,300	5,600	5,100	3,400	3,200
Iron and steel, metal:						
Pig iron	thousand metric tons	1,335	1,394	1,289	1,050	1,325
Steel:						
Crude	do.	2,144	2,317	2,160	1,401	1,678
Semimanufactures	do.	2,225	2,138	2,196	1,452 [r]	1,594
Manganese ore:						
Run-of-mine:						
Gross weight		50,000	51,000	50,000	43,000 [r]	55,000
Mn content[e]		13,400	13,600	13,400	11,567 [r, 3]	14,740
Concentrate:[e]						
Gross weight		15,000	15,000	15,000	15,000	15,000
Mn content		5,000	5,000	5,000	5,000	5,000
INDUSTRIAL MINERALS						
Cement, hydraulic	thousand metric tons	3,724	3,552	3,544	3,200 [e]	2,560 [e]
Clays:						
Bentonite, raw		6,600	54,000	50,000	45,000 [e]	30,000
Kaolin, raw and washed		7,000	3,000	3,000	2,800 [e]	2,800 [e]
Gypsum and anhydrite		30,000	26,000	26,000	24,000 [e]	20,000
Nitrogen, N content of ammonia[e]	thousand metric tons	275	300	300	300	300
Perlite		71,000	67,000	67,000	82,000 [r]	80,000
Sand and gravel:						
Gravel	thousand metric tons	34,483	29,400	25,000	23,496 [r]	23,000 [e]
Sand:						
Common	do.	11,634	5,400	5,400	12,095 [r]	12,000
Foundry		120,000	117,000	100,000	111,000 [r]	100,000
Glass		251,000	220,000	220,000	85,000 [r]	80,000
Stone:						
Dimension, all types[e]	thousand metric tons	5,000	5,745 [r, 3]	5,700 [r, 3]	5,500	5,500
Dolomite	do.	8,142	6,270	6,200	933 [e]	900
Limestone	do.	3,517	3,287	3,200	1,868 [r]	1,800
Sulfur, byproduct, elemental, all sources[e]		50,000	65,000	65,000	60,000	60,000
Sulfuric acid[e]		80,000	80,000	80,000	75,000	75,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown	thousand metric tons	1,352	1,392	1,373	952 [r]	911
Lignite	do.	8,467	8,352	8,041	8,025 [r]	8,203
Total	do.	9,819	9,744	9,414	8,977	9,114
Coke, metallurgical		921,062	1,016,547	998,809	746,155	750,000 [e]
Gas, natural	million cubic meters	3,246	2,653	2,691	3,120 [r]	3,100
Peat		77,300	89,000	90,000	90,000 [e]	90,000
Petroleum:[e, 4]						
Crude	thousand 42-gallon barrels	5,930	5,610	5,180	4,970	5,284 [5]
Refinery:						
Motor fuel (including aviation fuel)	do.	11,700	11,900	11,600	11,600	11,100
Gas oil	do.	26,900	28,800	28,900	28,900	28,600
Fuel oil	do.	1,800	1,000	900	900	900
Total:	do.	40,400	41,700	41,400	41,400	40,600

See footnotes at end of table.

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TABLE 1—Continued

HUNGARY: PRODUCTION OF MINERAL COMMODITIES[1]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 31, 2012.

[2]In addition to the commodities listed, diatomite, lime and a variety of industrial minerals and construction materials, such as common clay and talc, may have been produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Figures were converted to barrels from production reported in thousand metric tons, which was reported as the following: Crude production in 2006—886; 2007—839; 2008—775; 2009—743; and 2010—790. Petroleum products (totals) in 2006—5,092; 2007—5,249; 2008—5,225; 2009—5,220 (estimate); and 2010—no information available.

TABLE 2

HUNGARY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity holders	Location of main facilities	Annual capacity
Alumina	Magyar Aluminium Ltd. (MAL)	Ajka Timfoldgyar plant, about 120 kilometers southwest of Budapest, near Lake Balaton	400
Bauxite	do.	Bakony bauxite mine 5 kilometers south of Ajka	NA
Cement	Holcim Hungaria Zrt. (Holcim Ltd.)[1]	Plants at Labatlan and Hejocsaba	2,100
Do.	Duna-Drava Cement Kft. (HeidelbergCement AG, 50%, and Schwenk Zement KG, 50%)	Plants at Beremend, 30 kilometers south of Pecs, and Vac, 35 kilometers north of Budapest	2,500
Clays	Agyag-Asvany Kft	Two opencast mines at Felsopeteny	NA
Coal:			
Brown coal	Vertes Power Plant Ltd. (Magyar Villamos Muvek Zrt., 96.59%)	Markushegy Mine at Oroszlany, 55 kilometers west of Budapest	1,400 [e]
Lignite	Mátrai Erömü Zrt. (MÁTRA) (RWE AG, 50.9%; Magyar Villamos Muvek Zrt., 25.5%; EnBW AG, 21.7%)	Thorez opencast mine at Visonta, 80 kilometers northeast of Budapest	4,700 [e]
Do.	do.	Opencast mine at Bukkabrany, 130 kilometers northeast of Budapest	4,000 [e]
Coke	ISD Kokszolo Ltd. (ISD Dunaferr Co. Ltd.)	Dunaujvaros, 60 kilometers south of Budapest	1,000
Iron, pig iron	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass)	do.	1,400
Manganese	NA	Urkut manganese ore mines, 120 kilometers southwest of Budapest	NA
Natural gas	Hungarian Oil and Gas Co. (MOL)	Oil and gas fields in southern and southwestern Hungary	NA
Perlite	Perlit 92 Kft	Palhaza, northeastern Hungary; opencast mine and processing plant	NA
Petroleum:			
Crude 42-gallon barrels per day	Hungarian Oil and Gas Co. (MOL)	Oil and gas fields in southern and southwestern Hungary	14,800 [e]
Refined	Duna Refinery [Hungarian Oil and Gas Co. (MOL)]	Szazhalombatta, 25 kilometers southwest of Budapest	8,100
Pig iron	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass)	Dunaujvaros, 60 kilometers south of Budapest	1,300
Silica	Uveg-Asvany Banyaszati Ipari Kft.	Mine and plant at Fehevaresugo	NA
Steel, crude:			
Primary	ISD Dunaferr Co. Ltd. (Industrial Union of Donbass)	Dunaujvaros, 60 kilometers south of Budapest	1,600
Secondary	OAM OZD Steelworks Ltd.	120 kilometers northeast of Budapest	360
Do.	Dam 2004 Acel-es Hengermu Kereskedemi es Szolgaltato Ltd.[2]	Diosgyor, 145 kilometers northeast of Budapest	550

[e]Estimated. Do., do. Ditto. NA Not available.

[1]Holcim Hungaria Zrt.'s plant at Labatlan temporarily halted cement production in the third quarter of 2009.

[2]Stopped production in December 2008.

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The Mineral Industry of Iceland

By Harold R. Newman

Iceland has abundant renewable energy resources. Its plentiful geothermal and hydroelectric power sources allow most of the population to use electricity and heating from these sources. Aluminum was Iceland's leading mineral commodity followed by ferrosilicon; the country accounted for about 2% of global production of primary aluminum and about 1% of ferrosilicon production (Bray, 2011; Corathers, 2011). The country's aluminum and ferrosilicon industries used substantial amounts of energy and relied on imported raw materials and inexpensive geothermal and hydroelectric energy.

Iceland had few proven mineral resources and was dependent on imports to meet domestic demand for mineral commodities. The total value of imported goods was $201.2 million. Because of the country's geographic proximity to the European Union (EU) and membership in the European Free Trade Association, most of Iceland's trade was with Europe (U.S. Department of State, 2010). U.S. exports to Iceland included petroleum products valued at $21 million; metallurgical-grade coal, $8 million; iron and steel products, $56,000 (U.S. Census Bureau, 2011a).

Iceland's economy was heavily dependent on its export sector. Aluminum accounted for the majority of Iceland's exports of goods followed by ferrosilicon. In 2010, the total value of exported goods was $324.9 million. U.S. imports from Iceland included material handling equipment, $76,000; cement, lime, sand, and stone, $290,000; finished metal shapes, $25,000; and iron and steel manufactures, $16,000 (U.S. Census Bureau, 2011b).

Production

Production of aluminum using mainly imported materials increased in 2010. Because Iceland had few proven mineral resources, metallic minerals were not available in sufficient quantities to make mining feasible with existing technology. The production of industrial minerals included cement, crushed stone, pumice, salt, sand and gravel, and scoria. Production of these industrial minerals was used by local industries (table 1).

Structure of the Mineral Industry

The majority of the shares of the major mineral enterprises, except for aluminum producers, was owned by the Government. The remaining mineral enterprises were foreign owned and locally operated, or, in the case of small mineral-related businesses, locally owned and operated (table 2).

Commodity Review

Metals

Aluminum.—Construction of a new pot relining facility was started at Alcoa Inc. of the United States' Fjaröaál smelter at Reydarfjordur at an estimated cost of about $30 million. Aluminum was produced in 336 pots in the Fjaröaál smelter and these pots needed to be relined every 5 to 7 years. The new pot relining facility was to consist of a pot relining building, a spent pot lining building, and an office building. The pot relining facility would have the capacity to line 3 pots at a time (Alcoa Inc., 2010).

Rio Tinto Alcan of Canada announced that it was investing $487 million in its Straumsvik smelter to increase production by 20%. Straumsvik was expected to commence a gradual increase in its production in April 2012 and to complete the increase by July 2014. The company's announcement came following the signing of a long-term energy agreement with Landsvirkjun, which was the state-owned power utility (Associated Press, The, 2010).

Outlook

Aluminum and ferroalloy production are expected to continue to dominate the mineral resource sector. Petroleum exploration is expected to resume offshore Iceland as the country recovers from the financial crisis of 2008–9.

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TABLE 1
ICELAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007[e]	2008	2009[e]	2010[e]
Aluminum, metal, primary[2]		328,424	446,297 [r, 3]	761,204 [r]	804,605 [r, 3]	812,980 [3]
Cement, hydraulic[4]		141,433	140,000	138,000 [r]	138,000	140,000
Ferrosilicon		113,798	114,000	107,882 [r]	112,983 [r, 3]	114,231 [3]
Pumice and related volcanic material:						
Pumice		92,663	95,000	95,000 [e]	95,000	92,000
Scoria[e]		1,000	1,000	1,000	1,000	1,000
Salt[e]		4,500	4,500	4,500	4,500	4,500
Sand:[e]						
Basaltic	cubic meters	1,200	1,200	1,000	1,000	1,000
Calcareous, shell	do.	75,000	75,000	70,000	70,000	70,000
Sand and gravel	thousand cubic meters	4,200	4,200	4,000	4,000	4,000
Silica dust[5]		24,955	25,000	24,000	24,000	24,000
Stone, crushed:[e]						
Basaltic		95,000	95,000	95,000	90,000	90,000
Rhyolite	cubic meters	18,000	18,000	18,000	16,000	16,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto.
[1]Table includes data available through October 31, 2011.
[2]Ingot and rolling billet production.
[3]Reported figure.
[4]Sales.
[5]Byproduct of ferrosilicon.

TABLE 2
ICELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum	Alcoa Inc.	Fjaröaál smelter at Reydarfjordur	347
Do.	Reykjavik [ISAL] (Rio Tinto Alcan, 100%)	Straumsvik	190
Do.	Century Aluminum Co.	Grundartangi	260
Cement	Sementsverksmidja Rikisins (Government, 100%)	Akranes	115
Ferrosilicon	Elkem Iceland (Elkem A/S)	Plant at Grundartangi	100
Fertilizer	Aburdarverksmidja Rikisins (Government, 100%)	Gufunes	60
Pumice	Hekla Pumice Co.	Mount Hekla	210
Do.	Pumice Products Ltd. (BM Valla Ltd., 100%)	do.	32
Salt	Icelandic Salt Co. (Akzo Nobel NV, 58%)	Plant at Svartsengi	5

Do., do. Ditto.

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The Mineral Industry of Ireland

By Alberto Alexander Perez

In 2010, the gross domestic product (GDP) of Ireland was $172.3 billion based on purchasing power parity, which was a decrease of about 1% compared with that of 2009. The financial crisis of 2009–10 was continuing to affect all sectors of Ireland's industry and services, including the mineral industry, and the general unemployment rate rose to 13.6%. The Organisation for Economic Co-operation and Development (OECD) forecast a slow economic recovery and projected that the economy would grow by 1.6% in 2011.

In 2010, Ireland's total exports increased by 6.3% to $110.1 billion. This increase in exports was expected to continue as long as the world financial situation did not worsen in 2011 because of the euro currency crisis. Ireland's main export partners, in terms of their share of the total value of all exports, were the United States (22.1%), the United Kingdom (16.1%), Belgium (15.1%), Germany (8.1%), France (5.3%), and Spain (4.2%). Ireland was a member of the European Union (EU), and more than 50% of its exports went to countries belonging to the EU. About 65% of Ireland's imports, in terms of value, originated in the EU; in contrast, only 4.1% of Ireland's imports originated in China. Ireland also was part of the European Monetary Union, and, consequently, its official currency was the euro (€) (Organisation for Economic Co-operation and Development, 2011; U.S. Central Intelligence Agency, 2011).

Minerals in the National Economy

In 2010, exports remained a small component of Ireland's GDP. Minerals accounted for about 1% of its exports. Mining accounted for about 1% of the GDP, and an estimated 1,000 people were directly employed in the mining industry (Department of Communications, Energy and Natural Resources, 2009, p. 23; U.S. Central Intelligence Agency, 2011).

Production

In 2010, production of most minerals and metals decreased with the exception of alumina production, which increased by 50.3%. Lead production decreased by 9% compared with that of 2009, and production of silver and zinc decreased by 49% and 4%, respectively. Ireland was a significant producer of zinc in the world and the principal producer in the EU. Ireland was also a significant producer of mined lead in 2010. There were five operating mines in Ireland. They were, in order of the value of output, the Tara lead and zinc mine, in Navan, Co. Meath, which was owned by Boliden Tara Mines Ltd. (a subsidiary of Boliden AB of Sweden) and was the leading zinc mine, by volume, in the EU; the Lisheen lead-zinc mine, which was owned by Anglo American plc; the Drummond and Knocknacran gypsum mines, which were owned by Irish Gypsum Ltd. (a subsidiary of Saint Gobain group of France); and the Maddoxtown Mine in Co. Kilkenny, which produced dolomite and limestone and was owned by Roadstone Wood Ltd. (a wholly owned subsidiary of CRH plc) (table 1; Department of Communications, Energy and Natural Resources, 2009, p. 23; Department of Communications, Energy and Natural Resources, Exploration and Mining Division, 2011).

Structure of the Mineral Industry

Although Ireland was a significant world producer of lead and zinc, mines and the mineral-processing industry contributed only a small percentage of the country's GDP. Companies were mostly privately owned. The Exploration and Mining Division of the Department of Communications, Energy and Natural Resources is responsible for both the technical management of the state mineral licensing and leasing system and for promoting the mineral industry. The major mineral industry facilities and their capacities are listed in table 2.

Commodity Review

Metals

Bauxite and Alumina.—In 2010, United Company RUSAL of Russia resumed operations at its alumina refinery which was located on Aughinish Island on the south side of the Shannon estuary near Limerick City and operated by Aughinish Alumina plc. Aughinish Alumina produced about 1.86 million metric tons (Mt) of alumina in 2010, which was an increase of 50% compared with production in 2009. The alumina was obtained by treating bauxite ore using the Bayer process (United Company RUSAL, 2011, p. 7).

Lead and Zinc.—Galmoy Mines Ltd. recommenced operations at its Galmoy Mine in early 2010. Glamoy Mines Ltd. was a subsidiary of Lundin Mining Corp. of Canada. The mine had stopped operations in June 2009 because of the collapse in the prices of base metals (Department of Communications, Energy and Natural Resources, Exploration and Mining Division, 2011, p. 1).

Boliden Tara Mine's operation in Navan, Co. Meath, continued to be the leading zinc mine in Europe. In 2009, it milled a revised 2.6 Mt of ore grading 7% zinc and 1.4% lead. This ore yielded more than 185,000 metric tons (t) of zinc and 23,000 t of lead metal in concentrate. The mine's Joint Ore Reserves Committee (JORC)-classified ore reserves (proven and probable) were 16 Mt grading 7.1% zinc and 1.8% lead (Department of Communications, Energy and Natural Resources, Exploration and Mining Division, 2011, p. 1).

Industrial Minerals

Dolomite and Limestone.—Roadstone Wood produced dolomite and limestone from an open pit mine at Maddoxtown,

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near Bennettsbridge in Co. Kilkenny. The material was processed on site and used as aggregate by the construction industry (Department of Communications, Energy and Natural Resources, Exploration and Mining Division, 2011, p. 2).

Gypsum.—Irish Gypsum extracted gypsum from two sites in southern Co. Monaghan. An estimated 300,000 t was produced from an opencast operation in Knocknacran and the adjoining underground mine at Drummond; this output was 100,00 t less than the 400,000 t that was produced in 2009. The continued collapse of the construction market in Ireland appears to have been a leading cause for the decrease in production. The gypsum was crushed and blended locally and then supplied to Irish Gypsum's plaster mill and plaster board plant in Kingscourt. Additional material was supplied to the Irish agricultural and cement industries (Department of Communications, Energy and Natural Resources, Exploration and Mining Division, 2011, p. 2).

Mineral Fuels

Exploration offshore Ireland has never received the same level of interest as offshore Norway or the United Kingdom, despite similarities of geology. In the past, offshore oil exploration has not been particularly successful.

Outlook

Ireland will likely remain a major EU producer of zinc ore and a significant producer of alumina and lead ore. Exploration activity for additional new mineral resources, with the main emphasis on gold, lead, and zinc, is expected to continue.

The financial crisis that continued to affect Ireland in 2010 affected all aspects of the economy. The failed Irish banking and construction sectors still seemed heavily affected by a contraction in domestic consumption, and individual asset worth among the general public affected directly all investment and production in the country. Oil and gas exploration and further development of the energy sector and of renewable energy will likely continue to be a priority, and interest in exploring for petroleum and gas off the shores of Ireland is likely to increase.

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TABLE 1
IRELAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Alumina[e]		1,800	1,800	1,890	1,240 [2]	1,864 [2]
Lead:						
Mine output, Pb content	metric tons	61,800	54,100	50,200	43,000	39,100
Metal, refined, secondary[e]	do.	21,700 [2]	22,500	20,000	19,000	19,000
Silver, mine output, Ag content	kilograms	4,100	4,000 [e]	8,462	8,000 [e]	4,061
Zinc, mine output, Zn content	metric tons	425,756	400,898	398,200	357,000	342,500
INDUSTRIAL MINERALS[3]						
Cement, hydraulic		4,981	5,000	3,900	2,600 [e]	2,290 [e]
Gypsum[e]		700	700	600 [r]	400	300
Lime[e]		300	300	300	300	300
Sand and gravel:[e, 4]		12,000	12,000	25,000	20,000	20,000
Stone and other quarry products:[e]						
Limestone	million metric tons	1	1	1	1	1
Other[5]	metric tons	36,000	36,000	60,000	45,000	45,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, natural, marketed	million cubic meters	535 [e]	566	502	413	402
Peat:[e, 6]						
For horticultural use		500	500	500	500	500
For fuel use, milled peat[7]		3,800 [2]	3,800	3,800	3,800	3,800
Total		4,300	4,300	4,300	4,300	4,300
Briquets		260 [2]	300	300	300	300
Petroleum refinery products:[8]						
Liquefied petroleum gas	thousand 42-gallon barrels	593	405	387	394	390 [e]
Naphtha[e]	do.	900	900	900	900	900
Gasoline, motor	do.	5,365	4,987	4,797	3,701	3,700 [e]
Distillate fuel oil	do.	8,370	8,989	8,726	7,712	7,700 [e]
Residual fuel oil	do.	7,102	8,070	7,469	6,009	6,000 [e]
Refinery fuel and losses	do.	821	798	872	816	810 [e]
Total[e]	do.	23,200	24,100	23,200	19,500 [r]	19,500

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto.
[1]Table includes data available through January 11, 2012.
[2]Reported figure.
[3]Ireland also produces significant quantities of synthetic diamond and is the major supplier to the United States. Output, however, is not quantitatively reported, and general information is inadequate to make reliable estimates of output.
[4]Excludes output by local authorities and road contractors.
[5]Includes clays for cement production, fire clay, granite, marble, rock sand, silica rock, and slate.
[6]Includes production by farmers and by the Bord Na Mona (Government Peat Board).
[7]Includes milled peat used for briquet production.
[8]From imported crude oil.

TABLE 2
IRELAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facility	Annual capacity
Alumina		Aughinish Alumina plc (United Company RUSAL)	Aughinish Island, Co. Limerick	1,800
Cement		Irish Cement Ltd.	Plants in Co. Limerick and Platin, Co. Meath	2,000
Lead-zinc, concentrate		Anglo American plc	Lisheen Mine, Co. Kilkenny	160
Do.		Boliden AB	Tara Mine, Navan, Co. Meath	215
Natural gas	million cubic meters	Star Energy Group plc [Petroliam Nasional Berhad (PETRONAS) 100%]	Kinsale Head Field, Celtic Sea	2,100
Nitrogen, N content of ammonia		Irish Fertilizer Industries	Plant at Marino Point	450
Peat		Bord Na Mona (Government Peat Board)	Production mainly in the Midlands	4,200
Petroleum, refined	42-gallon barrels per day	ConocoPhillips Whitegate Refinery Ltd.	Whitegate, near Cork	71,000

Do. Ditto.

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THE MINERAL INDUSTRY OF ITALY

By Alberto Alexander Perez

In 2010, Italy's gross domestic product (GDP) based on purchasing power parity (PPP) amounted to an estimated $1.814 trillion, which was an increase of 1.3% compared with that of 2009. In terms of GDP based on PPP, the country ranked fourth in the European Union (EU) after Germany, the United Kingdom, and France. Italy's industrial sector accounted for about 25.2% of the GDP in 2010, which was a 0.2% increase from the previous year. Italy's most important industrial facilities, in terms of the value of output, were its aluminum, automotive assembly, chemicals, iron and steel, and machine tooling and metal working facilities. These industries continued to be heavily dependent on imported nonfuel and fuel mineral inputs. Italy was also well known for its industrial mineral resources. Its Carrara and Sienese marbles were appreciated for their natural qualities, and the production of clays was extensive. Italy was the 13th ranked manufacturer of cement in the world, measured by volume of production. Italy has gone through an economic development phase similar to that of France, Germany, and the United Kingdom, however, and has become mostly a services-based economy, which has led to specialization in its manufacturing and mineral industries. In 1970, industry's share of the country's GDP was 30% whereas that of services was 51.9%. In 2010, industry accounted for only 25.2% of the GDP and services accounted for 72.9% of the GDP (Cembureau, 2011, p. 4; U.S. Central Intelligence Agency, 2011).

Minerals in the National Economy

Italy's mineral industries produced such metals as copper, iron and steel, lead, and zinc, all of which were important materials for the country's manufacturing sector. The raw materials used to produce these and other metals were imported ores and concentrates or were obtained from secondary scrap recovery. Italy was a significant world producer of a variety of industrial minerals, which included cement, clays, feldspar, lime, marble, pumice, and sand and gravel (table 1).

Italy was highly dependent on imported mineral fuels. Eni S.p.A., which was 30% owned by the Italian Government, was the country's leading petroleum and natural gas company.

Government Policies and Programs

The Government played a significant role in the economy through regulation of ownership of large financial and industrial companies; privatization and regulatory reform in accordance with EU directives, however, has reduced that role in recent years. Italy's basic mining legislation is mining law No. 1443 of July 29, 1927, which gives subsoil ownership of minerals to the state. The reimbursement of the state by mining concessionaires is regulated by law No. 752 of June 10, 1982. Quarrying operations are regulated by law No. 44 of September 1982.

All petroleum and gas upstream activities are supervised by the Ufficio Nazionale Minerario per gli Idrocarburi e la Geotermia [National Office for Mining, Hydrocarbons, and Geothermal Resources] (UNMIG), which operates within the Ministero dello Sviluppo Economico [Ministry of Economic Development]. After various organizational changes, the seven offices that compose UNMIG now all operate within the Directorate General for Energy and Mineral Resources. By Presidential Decree, in 2007, the Committee for Hydrocarbons and Mineral Resources (CIRM) was set up to carry out UNMIG's duties. The committee performs technical advisory tasks related to mining, hydrocarbons, and royalties (Ministero dello Sviluppo Economico, 2010).

Environmental issues in Italy were focused on three main problem areas—air pollution from industrial emissions, such as sulfur dioxide; water pollution of coastal and inland rivers from industrial and agricultural effluents; and such natural hazards as avalanches, landslides, land subsidence in Venice, and volcanic eruptions (U.S. Central Intelligence Agency, 2011).

Production

In 2010, pig iron production increased by 50.3% compared with that of 2009 to 8.56 million metric tons (Mt); aluminum production increased by 41.8%, silicomanganese production increased by 35.3%, and crude steel production increased by 29.7% to 25.75 Mt. Ferromanganese production, however, decreased by 69%, and alumina ceased to be produced.

In the industrial minerals sector, granite production increased by 60%, nitrogen production increased by 27.3%, and salt production increased by 15.4%. The production of ball clay decreased by 42.8%; bentonite, by 24%, silica sand, by 10.6%; common clay, by 6.7%; and cement, by about 5.3%. Among the mineral fuels, crude petroleum production increased by 16% to 35 million barrels (table 1).

Structure of the Mineral Industry

The Italian Government has ultimate control of Italy's mineral industry. Mineral resources, by law, are the property of the Italian nation, but private and mixed public and private entities were the principal owners of Italy's mineral companies and facilities. Full Government (public) ownership continued mainly in the mineral fuels sector, where the Government retained 30% ownership of Eni (table 2).

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Mineral Trade

Exports of nonferrous metals[1] from Italy to other countries within the EU totaled $5.7 billion,[2] and those of metalliferous ores and metal scraps totaled $922 million. Imports of goods to Italy from other countries in the EU included manufactured metals valued at $6.186 billion, nonferrous metals valued at $8.28 billion, and metalliferous ores and metal scrap valued at $3.6 billion. In contrast, Italy's largest mineral industry imports, in terms of value, from a non-EU country (not including mineral fuels) were iron and steel (valued at $8.6 billion) and nonferrous metals ($5.7 billion). The leading exports from Italy to non-EU countries were iron and steel and manufactured metals that were valued at $5.3 billion and $6.6 billion, respectively (Eurostat, 2011, p. 110–112, 118–120, 126–128,134–136).

The most significant component of Italy's mineral trade in 2009 (the latest year for which data were available) was the net import of mineral fuels; Italy imported 82.09 million metric tons (Mt) of crude petroleum, which was a decrease of 8% compared with the level of crude petroleum imports in 2008. Of this amount, Italy imported at least 34% from the Commonwealth of Independent States (CIS), principally from, in order of volume, Russia, Azerbaijan, and Kazakhstan. At least 26% of Italian crude petroleum came from Africa; Libya, which was the important single country supplier for Italy, provided 25% of Italy's crude petroleum imports; Iraq, 11%; Iran, 7%; Saudi Arabia, 5%; Norway, 3%; the remaining 14% came from other sources (Eurostat, 2010).

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—In 2010, Italy stopped producing alumina. United Company RUSAL continued its suspension of operations at its Eurallumina facility in Italy owing to the high cost of running the facilities; there was no production reported from the plant in 2010 (table 1; United Company RUSAL, 2011, p. 34).

Primary aluminum production in the country decreased by 1.5%, and secondary production increased to 1.2 million metric tons (Mt). Alcoa Inc. of the United States had idled its smelting operations in Italy at Fusima and Portovesme after a ruling by the European Commission in 2009, which stated that a portion of the benefit received by Alcoa from the Italian Government based on an electricity tariff must be refunded because it did not comply with EU state aid rules. Alcoa appealed the decision; however, because of the high cost of production, Alcoa was considering closing the Portovesme plant permanently (table 1; Alcoa Inc., 2009). These events had a major effect on Italy's production, as the country's chief producers of alumina and primary aluminum were Rio Tinto-Alcoa Italia S.p.A. and Eurallumina S.p.A. (table 2).

Copper.—KME Group S.p.A. (a major European refiner and fabricator of copper headquartered in Florence) conducted its operations in Italy at Barga and at Scrivia under its subsidiary KME Italy S.p.A. Secondary copper and copper semimanufactures were the main mineral commodities produced at these locations (KME Group S.p.A., 2010, p. 4).

Simar S.p.A. (Simar), a member of the Cordofin Group S.p.A., had a refinery at Porto Marghera, near Venice. It produced mainly copper-zinc-titanium alloys. Simar's main product was known commercially as Zintek, and Simar created a company with the same name to develop and promote this product, although it was produced in Simar's facilities in Porto Marghera (Simar S.p.A., 2010). For its copper production, Italy imported small amounts of copper concentrate and relied mainly on imports of copper metal and scrap recovery.

Iron and Steel.—In 2010, Italy's pig iron production increased by about 50.3% from that of 2009 to 8.56 Mt. The production of crude steel increased by about 29.7% to 25.75 Mt compared with production of 2009, which was a contrast to Italy's highest ever production levels of 32 Mt achieved in 2007 (table 1). Italy's apparent consumption of crude steel increased to 26.6 Mt and ranked the country second in the EU after Germany (World Steel Association, 2011, p. 88).

Lead and Zinc.—A minor amount of lead and zinc concentrate was produced in Sardinia. Domestic mine production of lead and zinc was not sufficient to meet demand, and the country imported most of its requirements for lead and zinc concentrates. Glencore International AG of Switzerland remained the country's principal processor (smelter and refinery) of lead and zinc (table 2).

Industrial Minerals

In 2010, Italy remained a leading European and global producer of such industrial minerals as feldspar (24% of world output), pumice (18%), gypsum (3%), bentonite (2%), lime (2%), and cement (1%) (Cordier, 2010; Crangle, 2010a, b; Miller, 2010; van Oss, 2010; Virta, 2010).

Cement.—Italian cement production decreased by 5.3% owing to a continued decrease in construction sector output, which was driven by a sharp reduction of 9.7% in the output of the nonresidential construction sector and a reduction of 4.6% in that of the residential construction sector. The residential sector is unlikely to recover in the short to medium term, which makes public investment the likely source of a revival in this sector—a difficult proposition under austerity conditions (Cembureau, 2011, p. 5, 10).

Mineral Fuels

Natural Gas and Petroleum.—In 2010, Italy's output of natural gas increased by more than 2%, and crude petroleum production increased by 16% to 35.04 million barrels compared with production levels in 2009 (table 1). The country was not well endowed with hydrocarbons, and in 2009 (the latest year for which data were available), it imported 82.09 Mt (601.7 million barrels), which was a decrease of 8% from that of the previous year (table 1; Eurostat, 2010).

[1]The classifications stated are from the United Nations Statistics Division's Standard International Trade Classification, Revision 4 (Series M, no. 34, Rev. 4, March 2006).

[2] Where necessary, values have been converted from euro area euros (€) to U.S. dollars (US$) at an average exchange rate of €.755 = US$1.00 for 2010.

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Algeria and Italy agreed to accelerate the construction of the Galsi gas pipeline between Algeria and Italy. The pipeline was set to export 282 billion cubic feet per year of gas to Italy; construction was scheduled to start in 2010. Also, the Italian and Algerian Ministers had previously agreed in 2009 to increase the TransMed pipeline capacity by 247 billion cubic feet per year (Magharebia, 2009).

Outlook

Italy's construction and manufacturing industries have been the most affected by the decrease in international and domestic demand. It is not clear at what pace the Italian economy will recover once the world economy recovers because of a lack of investment sources in the short term. As one of the largest EU members in terms of population and the size of its industrial sector, Italy is expected to continue to be a major consumer and producer of durable goods and to continue to rely on imported and recycled mineral materials. The country is also likely to continue to rely on major imports of mineral fuels despite increases in domestic production from new deposits coming onstream in the near term.

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TABLE 1

ITALY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Alumina, calcined basis		1,463,218	1,327,364	1,327,566	752,873	--
Metal:						
Primary		194,200	182,600	188,400	170,600 r	168,000
Secondary[2]		1,277,799 r	1,318,884 r	1,282,917 r	826,977	1,246,236
Total		1,471,999	1,501,484	1,471,317	997,577 r	1,414,236
Bismuth, metal[e]		5	5	5	5	5
Copper, metal, refined, all kinds[e]		36,400 [3]	28,600	24,200	6,500	25,200
Iron and steel, metal:						
Pig iron	thousand metric tons	11,497	11,110	10,377	5,692	8,555
Ferroalloys, electric furnace:						
Ferromanganese		4,500	4,800	8,500	5,500	1,700
Ferrosilicon[e]		10,000	10,000	10,000	10,000	10,000
Silicomanganese		33,500	37,000	25,500	17,000	23,000
Other[e]		10,000	10,000	10,000	10,000	10,000
Total		58,000	61,800	54,000	42,500	44,700
Steel, crude	thousand metric tons	31,624	31,990	30,600	19,848	25,750
Lead:						
Mine output, Pb content[e]		800	800	800	800	800
Metal, refined:						
Primary		34,600	47,800	48,000	15,000 e	15,000 e
Secondary		155,900	164,000	164,000	134,000 e	134,000 e
Total		190,500	211,800	212,000	149,000 e	149,000 e
Silver, mine output, Ag content[e]	kilograms	-- r	-- r	-- r	-- r	--
Zinc, metal, primary		109,200	102,100	107,100	100,000 e	100,000
INDUSTRIAL MINERALS						
Barite[e]		5,000	5,000	5,000	3,500	3,500
Bromine[e]		300	300	300	300	300
Cement, hydraulic	thousand metric tons	43,234	47,541	43,000	36,317	34,408
Clays, crude:						
Common clay	do.	3,937	3,900	4,472	6,324	5,900
Bentonite	do.	470	306	281	146	111
Refractory, excluding kaolinitic earth	do.	1,964	1,960	942	844	844
Ball clay	do.	550	635	591	1,070	612
Fuller's earth[e]	do.	3	3	3	3	3
Kaolin[e]	do.	470	470	470	470	640 e
Diatomite[e]		25,000	25,000	25,000	25,000	25,000
Feldspar[e]	thousand metric tons	4,019 [3]	4,727 [3]	4,700	4,700	4,700
Fluorspar		15,000 e	--	--	--	--
Gypsum	thousand metric tons	2,860	5,458	5,450 e	5,101	4,441
Lime, hydrated, hydraulic, and quicklime[e]	do.	5,800	6,000	6,000	6,000	5,800
Magnesia[e]	do.	348 [3]	100	100	100	100
Nitrogen, N content of ammonia	do.	500 e	460 e	460 e	2,321	2,954
Perlite[e]		60,000	60,000	60,000	60,000	60,000
Pigments, mineral, iron oxides, natural[e]		500	500	500	105 [3]	117 [3]
Pumice and related materials:[e]						
Pumice	thousand metric tons	30	30	30	30	30
Pozzolan	do.	4,000	4,000	4,000	4,000	4,000
Salt	do.	3,438	2,214	2,200 e	3,471	4,006
Sand and gravel	do.	210,000 e	210,000 e	210,000 e	164,218	150,996
Silica sand	do.	14,000 e	14,000 e	14,000 e	19,759	17,656

See footnotes at end of table.

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TABLE 1—Continued

ITALY: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Sodium compounds, n.e.s.:[e, 4]						
Soda ash	thousand metric tons	500	500	500	500	500
Sodium sulfate	do.	125	125	125	125	125
Stone:						
Calcareous:						
Alabaster[e]	do.	7,000	7,000	7,000	7,000	7,000
Chalk[e]	do.	228 [3]	228	228	228	200
Dolomite	do.	2,192	1,726	1,700 [e]	1,601	1,572
Marble and travertine, crude	do.	4,687	4,643	4,600 [e]	4,604	5,500
Limestone for lime and cement	do.	41,255	32,953	32,900	41,090	38,440
Granite	do.	1,894	1,477	1,480	1,009	1,614
Sandstone	do.	397 [r]	397 [e]	397 [e]	451	497
Slate	do.	220	288	288 [e]	52	55
Crushed and broken[5]	do.	60,000 [e]	60,000 [e]	60,000 [e]	84,718	80,336
Sulfur:[e]						
From metallurgy	do.	90	90	90	90	90
From hydrocarbons	do.	650	650	650	650	650
Talc and related materials		146,942	112,080	112,000 [e]	112,000 [e]	110,000
MINERAL FUELS AND RELATED MATERIALS						
Asphalt and bituminous rock, natural	thousand metric tons	1,807	1,810	1,800 [e]	1,030	1,454
Coke, metallurgical[e]	do.	4,000	4,000	4,000	4,000	4,000
Gas, natural	million cubic meters	10,986	9,713	9,260	8,127	8,296
Natural gas liquids[e]	thousand 42-gallon barrels	350	350	350	350	350
Petroleum:						
Crude	do.	29,600 [e]	30,012	36,300	30,215	35,040
Refinery products	do.	748,150	770,892	719,499	665,541 [r]	660,000 [e]

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 31, 2012.

[2]Unwrought aluminum alloys in secondary form.

[3]Reported figure.

[4]Not elsewhere specified.

[5]Includes otput of limestone and serpentine for dimension stone.

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TABLE 2
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Eurallumina S.p.A. (United Company RUSAL, 56.2%)	Plant at Portoscuso, Sardinia	1,000
Aluminum	Alcoa Italia S.p.A. (Alcoa Inc., 100%)	Smelters at Porto Vesme, Sardinia, and Fusina, near Venice	188
Asbestos	Amiantifera di Balangero S.p.A.	Mine at Balangero, near Turin	100
Barite	Bariosarda S.p.A. (Ente Mineraria Sarda)	Barega and Monte Ega Mines on Sardinia	100
Do.	Edem S.p.A. (Government)	Mines at Val di Castello, Lucca	20
Do.	Edemsarda S.p.A. (Soc. Imprese Industriali)	Mines at Su Benatzu, Sto. Stefano, and Peppixeddu, Sardinia	20
Do.	Società Mineraria Baritina S.p.A.	Mines at Marigolek, Monte Elto, and Primaluna, near Milan	20
Bauxite	Sardabauxiti S.p.A. (Cogein S.p.A., 40%; Comtec S.p.A., 40%; Icofin Co., 20%)	Mine at Olmedo, Sardinia	350
Bentonite	Industria Chimica Carlo Laviosa S.p.A.	Mines and plant on Sardinia and a plant near Pisa	250
Cement	52 companies, of which the largest are: Italcementi Fabbriche Riunite Cemento S.p.A.	18 plants, of which the largest are Calusco, Collefero, and Monselice	15,000
Do.	Buzzi Unicem Group	11 plants, of which Guidonia, Lugagnano, Morano, Piacenza, S'Arcangelo di Romagna, and Settimello are the largest	9,000
Do.	Cementerie del Tirreno S.p.A.	6 plants at Arquasta Scivia, Livorno, Maddaloni, Napoli, Spoleto, and Taranto	5,300
Copper:			
Refined	Simar S.p.A.	Refinery at Porto Marghera	60
Refined, secondary	KME Italy S.p.A.	Refinery at Fornaci di Barga	24
Do.	Sitindustrie S.p.A.	Refinery at Pieve Vergonte	22
Feldspar	At least 5 companies, of which the largest are:	Locations:	1,500
Do.	Maffei S.p.A.	Surface mines at Pinzolo and Campiglia	(200)
Do.	do.	Underground mine at Vipiteno	(300)
Do.	Miniera di Fragne S.p.A.	Surface mine at Alagna Valsesia	(60)
Do.	Sabbie Silicee Fossanova S.p.A.	Surface mine at Fossanova	(30)
Gold kilograms	Sargold Resources plc.	Furtei Mine near Cagliaria, Sardinia	1,400
Gypsum	Fassa S.r.l.	Plant at Moncalvo, Asti	90
Lead, metal	Glencore International AG	Refinery at San Gavino, Sardinia	100
Do.	do.	Kivcet smelter and Imperial smelter at Porto Vesme, Sardinia	80
Lignite	Ente Nazional per l'Energia Electrica	Surface mine at Santa Barbara (closed)	1,000
Lime	Unicale S.p.A.	Plants in Lombardy region	500
Magnesium, metal	Societa Italiana Magnesio S.p.A.	Plant at Bolzano	8
Marble	A number of companies, of which the largest include:	Locations:	2,000
Do.	Mineraria Marittima Srl	Quarries in the Carrara and Massa areas	(500)
Do.	Industria dei Marmi Vicentini S.p.A.	do.	(300)
Do.	Figaia S.p.A.	do.	(100)
Nitrogen, N content of ammonia	Hydro Agri S.p.A.	Plant at Ferrara	410
Petroleum:			
Crude	Ente Nazional Idrocarburi	Oilfields: offshore Sicily, in the Adriatic Sea, and onshore in Po River Valley	90
Refined thousand 42-gallon barrels per day	do.	About 30 refineries	2,000

See footnotes at end of table.

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TABLE 2—Continued
ITALY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Potash, ore	Industria Sali Otassici e Affini per Aziono S.p.A.	Underground mines at Corvillo, Pasquasia, Racalmuto, and San Cataldo, Sicily (closed)	1,300
Do.	Sta. Italiana Sali Alcalini S.p.A. (Italkali)	Underground mines at Casteltermini and Pasquasia, Sicily	700
Pumice	Pumex S.p.A.	Quarries, Lipari Island, north of Sicily	600
Do.	Sta. Siciliana per l'Industria ed il Commercio della Pomice di Lipari S.p.A. (Italpomice S.p.A.)	do.	200
Pyrite	Nuova Solmine S.p.A.	Underground mines at Campiano and Niccioleta	900
Salt, rock	Sta Italiana Sali Alcalini S.p.A. (Italkahi)	Underground mines at Petralia, Racalmuto, and Realmonte, Sicily	4,000
Do.	Solvay S.p.A.	Underground mines at Buriano, Pontteginori, and Querceto, Tuscany	2,000
Steel	Ilva S.p.A. (Riva Group)	5 steel plants, the largest of which is Taranto (1,500)	4,000
Do.	Riva Acciaio S.p.A. (Riva Group)	7 steel plants	7,000
Do.	Acciaierie e Ferriere Vicentine Beltrame S.p.A. (AFV-Beltrame S.p.A.)	Steel plant at Vicenza	1,000
Talc	Luzenac Val Chisone S.p.A.	Mines at Pinerolo, near Turin, and at Orani, Sardinia	120
Do.	Talco Sardegna S.p.A.	Mine at Orani, Sardinia	20
Zinc, metal	Glencore International AG	Plant at Porto Vesme, Sardinia	120
Do.	Pertulosa Sud S.p.A.	Plant at Crotone, Calabria	100

Do., do. Ditto.

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The Mineral Industry of Kazakhstan

By Mark Brininstool

Kazakhstan produced a diverse range of mineral commodities and was the world's leading producer of uranium (33% of world output); the third ranked producer of chromium (16% of world output); the fourth ranked producer of titanium (11% of world output), cadmium (8% of world output), and magnesium metal (3% of world output); and the fifth ranked producer of rhenium (5% of world output). The country was also a significant producer of bauxite, copper, gallium, and zinc. The mineral industry accounted for a significant share of the country's gross domestic product (GDP) and foreign trade revenue; petroleum and natural gas were the leading commodities in terms of production value. Kazakhstan's Government promoted the development of the mineral industry but maintained partial Government ownership of significant mineral commodity producing companies. Kazakhstan's resource potential attracted an increasing number of companies and projects attempting to exploit the country's mineral wealth and could result in further increases of mineral commodity production in the country (Bray, 2011; Edelstein, 2011; Gambogi, 2011; Jaskula, 2011; Kramer, 2011; Papp, 2011; Polyak, 2011; Tolcin, 2011a, b; World Nuclear Association, 2010).

Minerals in the National Economy

In 2010, Kazakhstan's GDP increased by 7.3% compared with that of 2009 and was valued at $148 billion.[1] The value added from industrial production accounted for about 33% of the GDP, and the value added from mining and quarrying (which was included in the total value added of industrial production) made up about 19% of the GDP. Manufacturing (which was included in the total value added of industrial production) made up 11% of the GDP, and the processing of mineral commodities likely made up a significant share of manufacturing (although the exact proportion is not known). Total industrial production was valued at $82 billion and included $50 billion (61% of the value of industrial production) from mining, which included $42 billion from the extraction of crude petroleum and oil-well gas; $2.7 billion from mining of nonferrous metal ores; $1.7 billion from mining of iron ores; $890 million from extraction of coal; and $280 million from extraction of natural gas. The metallurgy industry contributed $11 billion to industrial output (Agency of Statistics of the Republic of Kazakhstan, 2011a; 2011c, p. 89, 170).

The mining and metallurgy industries attracted significant amounts of fixed capital investment and foreign direct investment in Kazakhstan. In 2010, total fixed capital investment in industry was about $18 billion, of which $11 billion (61%) was investment in the mining industry and $1 billion (6%) was investment in the metallurgy industry. Investment in crude petroleum and natural gas production made up about 76% of total fixed capital investment in the mining industry. Foreign direct investment in 2010 totaled about $17.4 billion, of which investment in geologic and prospecting activity accounted for $9.5 billion, investment in mining accounted for $3.6 billion (investment in crude petroleum and natural gas made up about $2.7 billion of the total mining investment), and investment in metallurgy accounted for $1.8 billion (Agency of Statistics of the Republic of Kazakhstan, 2011c, p. 107–108, 113–114).

Mining and quarrying were also important for employment in the industrial sector, although they made up only a small percentage of overall employment in Kazakhstan. In 2010, a total of 8.1 million people were employed in Kazakhstan, 948,800 people were employed in industry in Kazakhstan, and 193,700 people (20% of industrial employment and 2.4% of total employment) were employed in the mining and quarrying sector. The manufacturing sector employed 565,600 people, but no information was available as to what number of these employees were employed in the metallurgy and mineral processing sector (Agency of Statistics of the Republic of Kazakhstan, 2011b).

Production

Production of a large number of mineral commodities increased significantly during 2010. Production of ferrosilicochromium increased by 163%; primary aluminum metal, by 78%; bismuth metal, by 67%; mine output of gold, by 33%; antimony and phosphate rock, by 31% each; gold metal, by 30%; refined lead and uranium, by 27% each; manganese ore, by 24%; barite ore and cement, by 17% each; coal, by 15%; ferrochrome and silicomanganese, by 12% each; and lime, by 10%. Production of ferrosilicon decreased by 85%; titanium sponge, by 14%; and silver, by 11% (table 1).

Mineral Trade

In 2010, about 89% of Kazakhstan's $59.8 billion worth of exports was the result of exports of mineral commodities. Exports of mineral products accounted for $44.7 billion (75%) of total exports and another $8.1 billion (14%) was from exports of base metals and articles thereof. Another 5% ($3 billion) of export revenues was from exports of chemical products and products from related industries. Total imports were valued at $30.8 billion, of which 15% ($4.5 billion) was from the importation of mineral products and 12% ($3.7 billion) was from imports of base metals and articles thereof (Agency of Statistics of the Republic of Kazakhstan, 2011c, p. 135, 137–139).

[1]Where necessary, values have been converted from Kazakhstani tenge (KZT) to U.S. dollars (US$) at an annual average exchange rate of KZT147.35=US$1.00 for 2010, KZT147.50=US$1.00 for 2009, and KZT136.04=US$1.00 for 2004.

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Metals

Beryllium.—Beryllium production in Kazakhstan took place at the Ulba Metallurgical Plant (UMP) in Oskemen (formerly Ust-Kamenogorsk) from stockpiled beryl. UMP was a subsidiary of Kazatomprom JSC and was therefore a Government-owned company. Materion Corp. (formerly Brush Wellman Inc.) of the United States and IBC Advanced Alloys Corp. of Canada were significant consumers of beryllium produced at UMP. In May 2009, IBC and Kazatomprom signed a memorandum of understanding for strategic cooperation, and in November 2009, they signed a letter of intent to enter into long-term supply agreements and future investment opportunities. Production levels of beryllium in Kazakhstan were not reported by UMP and not enough information was available to make accurate estimates of production (IBC Advanced Alloys Corp., 2009a, b).

Chromium.—Kazakhstan produced about 15% of the world's output of chromite and was the world's third ranked producer in 2010 behind South Africa and India. Of the two producers of chromite in Kazakhstan, Eurasian Natural Resources Corp. plc (ENRC) was by far the leading producer, with 3,574,000 metric tons (t) of marketable chromite output in 2010. As of December 31, ENRC reported Australasian Joint Ore Reserves Committee (JORC)-compliant proven reserves of 76.2 million metric tons (Mt) of ore grading 42.3% Cr_2O_3 and probable reserves of 146.2 Mt of ore grading 41.1% Cr_2O_3. These reserves could provide the company a mine life of 48 years at 2010 levels of production (Eurasian Natural Resources Corp. plc, 2011, p. 146; Papp, 2011, p. 43).

ENRC's chromium division used the majority of its chromite internally to produce ferrochromium and ferrosilicochromium. In 2010, ENRC's ferroalloys division operated at full capacity and exceeded record production volumes previously set in 2007. The company began construction of four additional direct current furnaces at the Aktobe ferroalloys plant in 2010; each furnace would have the capacity to produce 440,000 metric tons per year (t/yr) of high-carbon ferrochromium. The project was expected to cost $750 million and to be completed by 2013. ENRC believed that the new furnaces would have the lowest production cost of any ferrochrome production facility in the world (Eurasian Natural Resources Corp. plc, 2011, p. 17, 34, 46).

ENRC planned to use the increased ferrochromium production capacity to increase sales to emerging markets, particularly to China. Kazakhstan exported about 428,000 t of ferrochromium to China (51% of total ferrochromium exports) in 2009 (the latest year for which data were available), 165,000 t (17%) in 2008, 271,000 t (27%) in 2007, and 179,000 t (19%) in 2006. Although exports to China could be expected to decrease in 2010 as ENRC sought better prices in Western Europe and Japan where demand was low in 2009 owing to the world economic slowdown, the figures demonstrate the increasing importance of China as a market for Kazakhstan's ferrochromium (Eurasian Natural Resources Corp. plc, 2011, p. 34; United Nations Statistics Division, 2011a, b).

Oriel Resources Ltd., a subsidiary of OAO Mechel of Russia, was added to the list of chromite ore producers in table 2. Initial production at Oriel's Voskhod GOK[2] began in December 2008, but production of commercial volumes of chromite began in 2009 when Voskhod produced 211,000 t of chromite concentrate; production in 2010 was 255,000 t. The complex was designed eventually to reach production of 600,000 to 700,000 t/yr of chromite concentrate. Chromite ore produced by Oriel was sent to Mechel's Tikhvin Ferroalloy Plant located in Tikhvin, Leningrad Oblast, Russia. Mechel estimated that Oriel had reserves of about 18.3 Mt of chromite (Mechel OAO, 2010; 2011a, p. 105–106, 110; 2011b).

Copper.—Kazakhmys plc of the United Kingdom was the dominant producer of copper ore and metals in Kazakhstan, and in 2010, the company operated 17 mines, 10 concentrating plants, and 2 smelting and refinery plants. In 2010, the company produced 335,000 t of copper content of concentrate and 306,000 t of refined copper cathodes, which accounted for about 88% of copper in concentrate and 95% of refined copper produced in Kazakhstan in 2010. The average copper grade of crude ore produced by Kazakhmys decreased to 1.09% from 1.18% in 2009, resulting in a 6% decrease in copper content of ore production despite a 2% increase in crude ore production. Ore grades were expected to continue to decrease but Kazakhmys planned to offset this decrease partially by increasing crude ore production volumes (table 1; Kazakhmys plc, 2011, p. 20).

Rhenium.—Rhenium in the form of ammonium perrhenate (APR) containing 69.2% rhenium was produced at state-owned enterprise Zhezkazganredmet (RedMet) from the tailings of copper production at Kazakymys's Zhezkazgan complex. Both of these facilities are located in Zhezkazgan, Karagandy Province. It is not known if RedMet also obtained raw materials for APR production from other sources. The Government considered rhenium to be a strategic mineral, and it was the exclusive producer and exporter of APR. Production and export figures for APR were not released by the Government, so production figures in table 1 have been estimated (Zhezkazganredmet, 2011).

Silicon.—In late 2010, Kazakhstan's first silicon metal plant, Silicium Kazakhstan LLP, began production. The plant started production from one 12,500-t/yr-capacity furnace and planned to start a second 12,500-t/yr-capacity furnace in May 2011. ThyssenKrupp Mannex of Germany was responsible for the construction of the plant, and ThyssenKrupp Metallurgie of Germany was the exclusive global distributor of the plant's products (ThyssenKrupp AG, 2011).

Industrial Minerals

Rare Earths.—No rare-earth metals were produced in Kazakhstan in 2010, but the Government supported the development of rare-earth projects through joint ventures with foreign companies. In 2010, Kazatomprom signed agreements to establish joint ventures that were focused on the production of rare metals and rare-earth metals with two Japanese companies. An agreement with Sumitomo Corp. was signed in March to establish Summit Atom Rare Earth Co. (SARECO), and in June

[2]GOK is the abbreviation for gorna-obogotitelniy kombinat, which translates as "mining and beneficiation complex."

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an agreement was signed with Toshiba Corp. to establish an unnamed joint venture. These projects were in the very early stages of development and at the end of 2010 no information was available about when production could potentially begin (Kazatomprom JSC, 2010a, b).

Mineral Fuels and Related Materials

Uranium.—In 2010, Kazakhstan remained the world's leading producer of uranium and accounted for about 33% of world uranium mine output. In 2009, Kazakhstan's production surpassed that of Canada, and for the first time, Kazakhstan became the world's leading producer of uranium. There were no nuclear powerplants in Kazakhstan and all uranium production was exported. Within the past 6 years, Kazakhstan rapidly increased its investment in its uranium industry, and the country's production of uranium increased from 3,300 t in 2003 to 17,803 t in 2010. Fixed capital investment in uranium and thorium mining increased from about $35 million in 2004 to about $309 million in 2009 (the latest year for which data were available). Foreign direct investment made up about 66% of uranium mining investment in 2009 (the latest year for which data were available) and was attracted through the establishment of joint ventures with the state-owned company Kazatomprom. According to the World Nuclear Association, Kazakhstan had 651,000 t of recoverable resources of uranium, which was the world's second largest national uranium resource after Australia (Agency of Statistics of the Republic of Kazakhstan, 2009, p. 208; 2010, p. 102, 205; World Nuclear Association, 2010, 2011).

On December 27, Uranium One Inc. of Canada acquired a 50% share of Akbastau JV and a 49.67% share of JV Zarechnoye JSC and received a cash payment of $610 million from JSC Atomredmetzoloto (ARMZ) of Russia in exchange for Uranium One shares. After the completion of the transaction, ARMZ (a subsidiary of the State Atomic Energy Corporation Rosatom) owned 51.4% of the shares of Uranium One (Uranium One Inc., 2011, p. 15).

Outlook

Interest in Kazakhstan's mineral industry will likely continue to increase along with an increase in the number of projects aimed at exploiting the country's relatively undeveloped mineral resources. Projects involving copper, gold, rare metals, and uranium could be of particular importance. In 2010, the President of Kazakhstan announced that Kazakhstan planned to more than double gold production to about 70 t/yr by 2015 and that Kazatomprom planned to increase total uranium production to about 28,000 t/yr by 2020. Copper miner Kazakhmys also had significant copper development projects planned, and in 2010, Rio Tinto plc of the United Kingdom signed an exploration and production agreement with the state-owned company Tau-Ken Samruk for a variety of mineral commodities, including bauxite, copper, gold, and iron ore. The number of exploration projects underway in Kazakhstan indicated the potential for future increases in production of mineral commodities in the country, but any future development will depend on a variety of factors, including mineral commodity prices and the development of Government policies and programs to encourage the growth of the industry (Gizitdinov, 2011; Thomson Reuters, 2010a, b).

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TABLE 1

KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Alumina		1,514,749	1,537,000 r	1,600,000 r	1,608,000	1,639,000
Bauxite, gross weight		4,883,800	4,963,000 r	5,160,100	5,130,000	5,310,400
Metal, primary		--	12,000 r	106,000	127,000 r	226,000
Antimony, Sb content of concentrate		1,010	952	890	597	785
Arsenic trioxide[e]		-- r	-- r, 3	-- r, 3	-- r	--
Beryllium		NA	NA	NA	NA	NA
Bismuth:						
Mine output, Bi content[e]		160	145	150	-- r, 3	-- 3
Metal, refined[e]		-- r	-- r	-- r	90 r	150
Cadmium, metal[e]		1,400 r	1,300 r	1,100 r	1,300 r	1,400
Chromite, marketable ore		3,366,078	3,687,200	3,552,000 r	3,544,000 r	3,760,000 e
Copper:						
Mine output, Cu content of concentrate		434,100	406,800 r	421,700	406,100 r	380,000
Metal:						
Smelter, undifferentiated		424,784 r	392,834	392,575	332,854 r	318,637
Refined, primary		427,723	406,091	398,411	312,767 r	323,368
Gallium	kilograms	17,000 e	18,666	18,666	18,702	18,702
Gold:						
Mine output, Au content	do.	21,824	22,564	20,825	22,839 r	30,272
Metal, refined	do.	9,011	8,157	8,205	10,279 r	13,313
Iron and steel:						
Iron ore, marketable:						
Gross weight		22,262,600	23,834,100	21,486,300	22,281,300 r	24,229,100
Fe content[e]		12,700,000	13,600,000	12,200,000 r	12,700,000 r	13,800,000
Metal:						
Pig iron		3,369,000 r	3,795,000 r	3,106,000 r	2,996,000 r	2,984,000
Ferroalloys:						
Ferrochromium		1,190,673 r	1,307,536	1,220,315	1,173,286 r	1,311,302
Ferrosilicochromium		117,607 r	145,695	133,828	60,829 r	159,765
Ferromanganese		-- r	-- r	-- r	-- r	--
Ferrosilicon		85,924 r	59,886	54,964	33,100 r	4,813
Silicomanganese		218,323 r	188,445	179,939	200,374 r	224,627
Other		1,787 r	1,222 r	1,473 r	1,205 r	1,283
Total		1,614,314 r	1,702,784 r	1,590,519 r	1,468,794 r	1,701,790
Steel:						
Crude		4,244,521	4,784,105	4,243,582	4,146,810	4,255,545
Finished, rolled		2,999,610 r	3,440,708	2,826,202	2,990,167 r	2,886,943
Lead:						
Concentrate, Pb content		48,100	40,200	38,800	39,400	36,100
Refined, primary and secondary		115,974	117,641	105,766	80,994 r	103,110
Magnesium, metal, primary[e]		21,000	21,000	21,000	21,000	21,000
Manganese ore, crude ore:						
Gross weight		2,531,100	2,482,000	2,485,000	2,457,400 r	3,041,800
Mn content[e]		550,000	600,000	600,000	520,000	640,000
Molybdenum, concentrate, Mo content		250	400	400	400 r	400
Nickel, Ni content of laterite ore[e]		200	200	500	500	500
Niobium, metal		NA	NA	NA	NA	NA
Rhenium[e]	kilograms	8,000	5,500	5,500	3,000	2,000
Silicon, metal[e]		-- r	-- r	-- r	-- r	1,500
Silver:						
Mine output, Ag content	kilograms	806,083	722,927	645,627	618,141 r	552,060
Refined	do.	796,234	707,954	628,763	613,544 r	547,665
Tantalum, metal		NA	NA	NA	NA	NA
Titanium:						
Ilmenite and leucoxene[e]		25,000	25,000	25,000	25,000	25,000
Sponge		23,000	25,400	26,000	16,800	14,500

See footnotes at end of table.

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TABLE 1—Continued

KAZAKHSTAN: PRODUCTION OF MINERAL COMMODITIES[1,2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS—Continued						
Vanadium, ores, concentrates, slag, V content[e]		1,000	1,000	1,000	1,000	1,000
Zinc:						
Concentrate, Zn content		404,600	386,000	387,400	398,400 r	404,500
Smelter, primary and secondary		364,821	358,226	365,572 r	327,873 r	318,858
INDUSTRIAL MINERALS						
Asbestos, all grades		314,700	292,600	230,100	230,000	214,100
Barite:						
Ore and concentrate		261,000	280,300	492,200	306,000	358,000
Marketable[e]		120,000 r	130,000 r	170,000 r	170,000 r	200,000
Boron[e]	thousand metric tons	30	30	30	30	30
Cement		4,880,200	5,698,600	5,837,300	5,694,100 r	6,686,300
Fluorspar		30,000 e	64,000	66,300	67,000	67,000 e
Gypsum[e]		820,000	653,600 r,3	696,900 r,3	700,000	700,000
Lime		988,094	1,023,178	905,917	798,180 r	881,225
Phosphate rock, beneficiated:						
Gross weight		845,000	720,000	1,226,000	1,225,000 r	1,600,000 e
P_2O_5 content[e]		195,000	165,000	280,000	280,000	350,000
Salt and sodium chloride		416,680	227,643	504,100	222,942 r	228,801
Sulfur, byproduct:[e]						
Metallurgy		300,000	300,000	300,000	300,000	300,000
Natural gas and petroleum		1,700,000	1,660,700 3	1,732,600 3	2,200,000 r	2,400,000 e
Total		2,000,000	1,960,000	2,030,000	2,500,000 r	2,700,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	91,547	94,014	106,296	91,042 r	99,285
Lignite	do.	4,773	4,370	4,777	5,084 r	7,283
Total	do.	96,320	98,384	111,073	96,126 r	106,568
Coke		2,627,500	2,925,000	2,687,700	2,552,000 r	2,681,800
Natural gas:[4]						
Nonassociated gas	thousand cubic meters	14,401,000	16,677,000	18,708,000	18,132,000	17,595,000
Associated gas	do.	11,981,000	12,884,000	14,181,000	17,809,000	19,811,000
Total	do.	26,382,000 r	29,561,000 r	32,889,000 r	35,941,000 r	37,406,000
Petroleum:						
Crude oil and gas condensate[5]	42-gallon barrels	473,000,000 r	488,000,000 r	514,000,000 r	556,000,000 r	578,000,000
Refinery products[6]	do.	88,900,000 r	90,200,000 r	93,400,000 r	92,900,000 r	101,600,000
Uranium:						
U content		5,279	6,637 r	8,521 r	14,020	17,803
U_3O_8 content		6,226	7,827 r	10,049 r	16,534	20,995

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]In addition to the commodities listed, Kazakhstan may also have produced a number of other mineral products, including cesium, germanium, indium, rare-earth elements, scandium, selenium, and tellurium, but information is inadequate to estimate production.

[2]Table includes data available through January 31, 2012.

[3]Reported figure.

[4]All natural gas production figures were revised; in previous Minerals Yearbook chapters only nonassociated natural gas production was reported.

[5]Figures were converted to barrels from metric tons (t), reported as follows: 2006—65,003,100 t; 2007—67,125,300 t; 2008—70,671,000 t; 2009—76,482,600 t; and 2010—79,517,700 t.

[6]Figures were converted to barrels from metric tons (t), which were reported as follows: 2006—11,202,000 t; 2007—11,384,000 t; 2008—11,791,000 t; 2009—11,717,000 t; and 2010—12,794,000 t.

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TABLE 2

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina	Aluminium of Kazakhstan JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Pavlodar	1,600,000
Aluminum, primary	Kazakhstan Aluminium Smelter JSC [Eurasian Natural Resources Corp. plc (ENRC)]	do.	250,000
Barite	Vostochnoye Rudoupravleniye LLP	Shyganak, Zhambyl Province	NA
Do.	Zhartas LLC	Zhambyl Province	25,000
Do.	Stroyservice LLC	Kentau district, South Kazakhstan Province	30,000
Do.	Zhairemsky GOK[3] JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Ushkatyn III, Zhairem, and Zhumanai deposits near Zhairem	NA
Do.	JSC Yuzhpolimetall	Kentau District, South Kazakhstan Province	NA
Do.	Barite Oil Kentau LLC	do.	NA
Bauxite	Kazakhstan Aluminium Smelter JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Torgai and Krasnooktyabrsk mining complexes, Kostanay Province	5,400,000
Beryllium, metal	Ulba Metallurgical Plant JSC (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Bismuth, metal	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	do.	NA
Do.	Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	NA
Cadmium	do.	do.	NA
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	Oskemen (also known as Ust-Kamenogorsk)	NA
Chromite, marketable ore containing about 50% Cr_2O_3 content	Donskoy GOK {Kazchrome JSC [a subsidiary of Eurasian Natural Resources Corp. plc (ENRC)]}	Khromtau, Aktobe Province	3,500,000
Do.	Oriel Resources Ltd. (Mechel OAO)	Voskhod GOK,[3] Khromtau, Aktobe Province	255,000
Copper:			
Mining, recoverable, Cu content	Kazakhmys plc:		
	Balkhash complex:		
	Konyrat Mine	Karagandy Province	11,800[4]
Do.	Sayak I and III Mines	do.	23,500
Do.	Shatyrkul Mine	Zhambyl Province	12,700
Do.	East Region complex:		
	Artemyevsky Mine	East Kazakhstan Province	7,820
Do.	Belousovsky Mine	do.	2,700[4]
Do.	Irtyshsky Mine	do.	5,750
Do.	Nikolayevsky Mine	do.	25,700
Do.	Orlovsky Mine	do.	86,200
Do.	Yubileyno-Snegirikhinsky Mine	do.	14,200
Do.	Karaganda Region complex:		
	Abyz Mine	Karagandy Province	5,710
Do.	Nurkazgan Mine	do.	1,190
Do.	Zhezkazgan complex:		
	Annensky Mine	do.	25,000
Do.	East Mine	do.	35,000
Do.	North Mine	do.	28,000
Do.	South Mine	do.	30,000
Do.	Stepnoy Mine	do.	30,000
Do.	West Mine	do.	23,300
Do.	Zhomart Mine	do.	60,000

See footnotes at end of table.

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TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Copper—Continued:			
Mining, recoverable, Cu content—Continued	Kazzinc JSC (Glencore International AG, 50.7%):		
	Ridder complex:		
	Ridder-Sokolny Mine	East Kazakhstan Province	NA
Do.	Shubinsky Mine	do.	2,750
Do.	Tishinsky Mine	do.	15,000
Do.	Zyrianovsk complex:		
	Maleevsky Mine	15 kilometers north of Zyryanovsk	62,100
Do.	Grekhovsky Mine	NA	NA
Do.	TOO Aktyubinsk Copper Co. (CJSC Russian Copper Co.)	50th Anniversary of October Mine, at Koktau, Aktobe Province	45,000
Concentrate, Cu content	Kazakhmys plc mines or plants:		
	Balkhash complex: Balkhash concentrator	Karagandy Province	40,000
Do.	East Region complex:		
	Belousovsky concentrator	East Kazakhstan Province	13,000
Do.	Irtyshsky concentrator	do.	6,000
Do.	Nikolayevsky concentrator	do.	30,000
Do.	Orlovsky concentrator	do.	70,000
Do.	Karaganda Region complex:		
	Karagaily concentrators	do.	28,000
Do.	Nurkazgan concentrators	do.	15,000
Do.	Zhezkazgan complex:		
	Satpayev concentrator	do.	30,000
Do.	Zhezkazgan No. 1 concentrator	do.	88,800
Do.	Zhezkazgan No. 2 concentrator	do.	111,000
Do.	Kazzinc JSC (Glencore International AG, 50.7%):		
	Ridder complex: Ridder concentrator	do.	10,000
Do.	Zyrianovsk complex: Zyrianovsk concentrator	do.	10,000
Metal	Kazakhmys plc mines or plants:		
	Balkhash complex:		
	Balkhash smelter	do.	250,000
Do.	Balkhash refinery	do.	250,000
Do.	Zhezkazgan complex:		
	Zhezkazgan smelter	do.	254,000
Do.	Zhezkazgan refinery	do.	254,000
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	Oskemen (also known as Ust-Kamenogorsk)	70,000
Ferroalloys:			
Ferrochrome:			
High-, medium-, and low-carbon FeCr containing 69% Cr	Aktobe plant {Kazchrome [Eurasian Natural Resources Corp. plc (ENRC)]}	Aktobe	400,000
High-carbon FeCr containing 69% Cr	Aksu plant {Kazchrome [Eurasian Natural Resources Corp. plc (ENRC)]}	Aksu	800,000
Ferrosilicon	do.	do.	NA
Ferrosilicochromium	do.	do.	NA
Silicomanganese	do.	do.	NA
Do.	Taraz Metallurgical Plant LLP (Sat & Co.)	Taraz, Zhambyl Province	NA
Do.	Temirtau Electrometallurgical Complex	Temirtau, Karagandy Province	NA
Gallium	Aluminium of Kazakhstan JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Pavlodar	NA
Indium	Kazzinc JSC (Glencore International AG, 50.7%)	NA	NA
Iron and steel:			
Pig iron	ArcelorMittal Temirtau	Temirtau, Karagandy Province	5,000,000
Steel, crude	do.	do.	6,000,000
Iron ore, marketable, gross weight	JSC Sokolov-Sarbai Mining Production Association [Eurasian Natural Resources Corp. plc (ENRC)]	4 open pit mines and 1 underground mine in Kostanay Region	25,000,000
Do.	TOO Orken (ArcelorMittal Temirtau)	Karagandy Province	5,000,000

See footnotes at end of table.

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TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1, 2]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Lead:				
Mining, recoverable Pb content of ore		Kazzinc JSC (Glencore International AG, 50.7%):		
		Ridder complex:		
		Shubinsky Mine	15 kilometers east of Ridder	461
Do.		Tishinsky Mine	15 kilometers southwest of Ridder	15,000
Do.		Zyrianovsk complex: Maleevsky Mine	15 kilometers north of Zyryanovsk	26,000
Do.		ShalkiyaZinc N.V.	Shalkiya Mine, 15 kilometers northeast of Zhanakorgan	NA
Concentrate, Pb content		Kazzinc JSC (Glencore International AG, 50.7%):		
		Ridder concentrator	Ridder, East Kazakhstan Province	NA
Do.		Zyrianovsk concentrator	Zyryanovsk, East Kazkahstan Province	NA
Do.		ShalkiyaZinc N.V.	Kentau concentrating plant, South Kazakhstan Province	NA
Do.		Nova Zinc LLP (JSC Chelyabinsk Zinc Plant)	Akzhal	4,000
Metal		Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	60,000
Do.		Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	Oskemen (also known as Ust-Kamenogorsk)	130,000
Magnesium, metal		Ust-Kamenogorsk Titanium-Magnesium Plant JSC	do.	23,000
Manganese, crude ore		Facilities:	Locations:	NA [5]
		Kazmarganets {Kazchrome JSC [Eurasian Natural Resources Corp. plc (ENRC)]}	Tur and East Kamys Mines, Karagandy Province	
		Zhairemskv GOK[3] JSC [Eurasian Natural Resources Corp. plc (ENRC)]	Perstenevsky, Ushkatyn III, Zhomart and Zapadny Zhomart Mines near Zhairem	
		Atasurda mining and processing complex (TOO Orken)	Atasu	
		TOO Arman 100	170 kilometers east of Zhezkazgahan, Karagandy Province	
		Temirtau Electrometallurgical Complex	Temirtau, Karagandy Province	
Natural gas	million cubic meters	Companies:	Locations:	16,000 [5]
		CNPC Aktobemunaigaz	Aqtobe	
		Embamunaigaz	Emba District	
		Huricane Kumkol Munai	Aral Sea region	
		Karachaganak Petroleum Operating BV	Northwestern Kazakhstan	
		Mangistaumunaigaz	Mangghhyshlaq Peninsula	
		Tengizchevroil joint venture	Tengiz, Zhanazhol, and Urikhtau deposits	
		Agip Kazakhstan North Caspian Operating Co. (AGip KCO)	Kashagana offshore field	
		Uzenmunaigaz	Uzen deposit	
Niobium, metal		Ulba Metallurgical Plant (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Petroleum:		Companies:	Locations:	32,000,000 [5]
Crude		CNPC Aktobemunaigaz	Aqtobe	
		Embamunaigaz	Emba District	
		Huricane Kumkol Munai	Aral Sea region	
		Karachaganak Petroleum Operating BV	Karachaganak field	
		Mangistaumunaigaz	Mangghhyshlaq Peninsula	
		Uzenmunaigaz	Uzen deposit	
Do.		Alibekmola, Ayrankul, Chinarevskoye, Kozhasay, North Buzachi, Sazankurak, Saztyube, and Urikhtau deposits	NA	NA
Do.	42-gallon barrels per day	Tengizchevroil joint venture	Tengiz deposit	750,000
Do.	do.	Agip Kazakhstan North Caspian Operating Co. (AGip KCO)	Kashagan offshore field	100,000
Refined, crude oil throughput	do.	Atyrau, Pavlodar, and Shymkent refineries	Atyrau, Pavlodar, and Shymkent, respectively	427,000

See footnotes at end of table.

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TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Phosphate rock, beneficiated	Chulaktau mining and processing complex (Kazphosphate LLC)	Chulaktau, Zhambyl Province	NA
Do.	Karatau mining and processing complex (Kazphosphate LLC)	Zhanatas, Zhambyl Province	NA
Do.	Temir Service LLP (Sunkar Resources plc)	Chilisai deposit, northwestern Kazakhstan	400
Rare-earth metals, products	Irtysh Rare Earths Company Ltd.	Pervomayskiy, about 50 kilometers northwest of Oskemen	NA
Rare metals (indium, selenium, tellurium, thallium)	Aktau complex	Aktau	NA [6]
Do.	Belogorskiy rare metals plant	Asubulak, East Kazakhstan Province	NA [6]
Do.	Chimkent metallurgical plant (JSC Yuzhpolimetall)	Shymkent	NA [6]
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	Oskemen (also known as Ust-Kamenogorsk)	NA [6]
Rhenium:			
Ammonium perrhenate (containing 69.2% Re)	Zhezkazganredmet (RedMet) (Government owned)	Zhezkazgan, Karagandy Province	NA
Rhenium in tailings from copper ore processing	Balkhash copper mining-metallurgical complex (Kazakhmys plc)	Karagandy Province	NA
Silicon, metal	Silicium Kazakhstan LLP	Karaganda	12,500
Silver, refined	Facilities: Chimkent metallurgical plant (JSC Yuzhpolimetall) Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)] Balkhash refinery (Kazakhmys plc)	Locations: Shymkent Oskemen (also known as Ust-Kamenogorsk) Karagandy Province	1,000 [5]
Tantalum, metal	Ulba Metallurgical Plant JSC (Kazatomprom JSC)	Oskemen (also known as Ust-Kamenogorsk)	NA
Titanium:			
Ore, ilmenite	Obukhovskoye, Satpayevskoye, and Shokashsk deposits	NA	30,000
Metal (sponge)	Ust-Kamenogorsk titanium-magnesium plant	Oskemen (also known as Ust-Kamenogorsk)	35,000
Uranium, U content	Kazatomprom affiliated companies, of which:	Locations:	18,000 [5]
Do.	Akbastau JV (Kazatomprom JSC, 50%, and JSC Atomredmetzoloto, 50%)[7]	Blocks 1, 3, and 4 of the Budenovskoye deposit, Sozak Region, South Kazakhstan Province	(740)
Do.	Appak LLP (Kazatomprom JSC, 65%; Sumitomo Corp., 25%; Kansai Electric Power Co. Inc., 10%)	West Mynkuduk Mine of the Mynkuduk deposit, Sozak Region, South Kazakhstan Province	(442)
Do.	Baiken-U LLP (Kazatomprom JSC, 60%, and Japanese consortium, 40%)	Block No. 2 of the Kharassan deposit, Zhanakorgan Region, Kyzylorda Province	(262)
Do.	Betpak Dala JV (Uranium One Inc., 70%, and Kazatomprom JSC, 30%)	Akdala Mine and Site No. 4 (South Inkai) Mine of the Inkai deposit, Sozak Region, South Kazakhstan Province	(2,729)
Do.	Inkai JV (Cameco Corp., 60%, and Kazatomprom JSC, 40%)	Blocks 1, 2, and 3 of the Inkai deposit, Sozak Region, South Kazakhstan Province	(1,637)
Do.	Karatau LLP (Kazatomprom JSC, 50%, and Uranium One Inc., 50%)	Block No. 2 of the Budenovskoye deposit, Sozak Region, South Kazakhstan Province	(1,708)
Do.	Katco JV (Areva Group, 51%, and Kazatomprom JSC, 49%)	Tortkuduk Mine and Block No. 1 of the South Moinkum deposit, Sozak Region, South Kazakhstan Province	(3,328)
Do.	JSC Ken Dala.kz (Kazatomprom JSC, 100%)	Central Mynkuduk deposit, Sozak Region, South Kazakhstan Province	(1,242)

See footnotes at end of table.

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TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1, 2]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Uranium, U content—Continued	Kazatomprom affiliated companies, of which—Continued:	Locations—Continued:	
	Kyzylkum LLP (Japanese consortium, 40%; Uranium One Inc., 30%; Kazatomprom JSC, 30%)	Block No. 1 of the Kharassan deposit, Zhanakorgan Region, Kyzylorda Province	(260)
Do.	Mining Company LLP (Kazatomprom JSC, 100%), of which:		
	Mining Group No. 6 LLP	North and South Karamurun Mines, Shieli and Zhanakorgan Regions, Kyzylorda Province	(1,017)
Do.	Stepnoye Mining Group LLP	Uvanas and East Mynkuduk Mines, Sozak Region, South Kazakhstan Province	(1,330)
Do.	Taukent Mining Chemical Plant LLP	Kanzhugan and South Moinkum Mines, Sozak Region, South Kazakhstan Province	(1,004)
Do.	Semizbai-U (Kazatomprom JSC and its subsidiary, Mining Company LLP, 51%; China Guangdong Nuclear Power Group, 49%)	Irkol Mine in Kyzlorda Province and Semizbai Mine, on the border of North Kazakhstan and Akmola Province	(974)
Do.	Stepnogorsk Mining-Chemical Complex LLP (Kazatomprom JSC, 100%)	Shantobe Mine of the Vostok and Zvezdnoe deposits, 300 kilometers west of Stepnogorsk	(352)
Do.	JV Zarechnoye JSC (Kazatomprom JSC, 49.67%, and JSC Atomredmetzoloto, 49.67%)[7]	Zarechnoye and South Zarechnoye deposits, Olrarski Region, South Kazakhstan Province	(778)
Zinc:			
Mining, recoverable, Zn content	Kazakhmys plc:		
	East Region complex:		
	Artemyevskoe Mine	East Kazakhstan Province	90,000
Do.	Belousovskoe Mine	do.	8,420
Do.	Irtyshskoe Mine	do.	18,000
Do.	Nikolaevskoe Mine	do.	48,700
Do.	Orlovskoe Mine	do.	78,200
Do.	Yubileyno-Snegirikhinskoe Mine	do.	16,500
Do.	Karaganda Region complex: Abyz Mine	Karagandy Province	20,800
Do.	Kazzinc JSC (Glencore International AG, 50.7%):		
	Ridder complex:		
	Ridder-Sokolny Mine	East Kazakhstan Province	NA
Do.	Shubinsky Mine	do.	4,000
Do.	Tishinsky Mine	do.	65,000
Do.	Shaimerden deposit	Kostanay Province	NA
Do.	Zyrianovsk complex: Maleevsky Mine	do.	135,000
Do.	ShalkiyaZinc N.V.	Kyzlorda Province	NA
Concentrate, Zn content	Kazakhmys plc:		
	East Region complex:		
	Artemyevsky concentrator	do.	55,000
Do.	Belousovsky concentrator	do.	5,800
Do.	Irtyshsky concentrator	do.	11,000
Do.	Nikolaevsky concentrator	do.	36,000
Do.	Orlovsky concentrator	do.	60,000
Do.	Karaganda Region complex: Karagaily concentrator	Karagandy Province	8,000
Do.	Nova Zinc LLP (JSC Chelyabinsk Zinc Plant)	Akshatau, Karagandy Province	35,000
Do.	Kazzinc JSC (Glencore International AG, 50.7%):		
	Ridder concentrator	Kyzlorda Province	NA
Do.	Zyrianovsk concentrator	Zyryanovsk, East Kazkhstan Province	NA
Metal	Ridder zinc refinery	East Kazakhstan Province	110,000
Do.	Ust-Kamenogorsk metallurgical complex [Kazzinc JSC (Glencore International AG, 50.7%)]	do.	190,000

See footnotes at end of table.

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TABLE 2—Continued

KAZAKHSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1,2]

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Table includes data available through January 31, 2012.

[2]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[3]GOK is the abbreviation for gorna-obogotitelniy kombinat, which translates as 'mining and beneficiation complex'.

[4]Production at the Konyrat (formerly known as the Kounrad Mine) and the Belousovsky Mines was suspended in 2008 owing to high production costs.

[5]Capacity estimates are totals for all enterprises that produce that commodity.

[6]It is unknown which, if any, rare metals are still being produced at this facility.

[7]On December 27, 2010, Uranium One Inc. purchased JSC Atomredmetzoloto's shares in Akbastau JV and JV Zarechnoye JSC.

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The Mineral Industry of Kosovo

By Mark Brininstool

On February 17, 2008, the Serbian Province of Kosovo declared its independence after having been under the administration of the United Nations' Interim Administration Mission in Kosovo since 1999. Kosovo had deposits of aggregates and construction minerals, bauxite, chromium, lead and zinc, lignite, magnesite, nickel, and silver. Almost all industry activities stopped in the late 1990s during fighting between ethnic Albanian guerilla groups and Serbian security forces, and in 2010, the mineral industry was still recovering, and production was limited (Independent Commission for Mines and Minerals, 2005).

Minerals in the National Economy

In 2010, the International Monetary Fund reported that Kosovo's real gross domestic product increased by 4% compared with that of 2009. Mineral commodities were an important source of export revenues for Kosovo's economy, but these revenues were still relatively small compared with the country's 2010 trade deficit of about $1.4 billion. As in 2009, exports of base metals and articles of base metals were the leading export category in terms of value and were valued at about $141 million,[1] or about 63% of the total value of all exports. The value of base-metal exports increased by about 110% compared with the value in 2009 owing to increased production of metals and higher prices for metals on the international market compared with prices in 2009. The value of exports of mineral products[2] increased by about 55% to about $30 million and made up about 13% of total exports. Mineral products were the leading import category and were valued at about $319 million and made up about 20% of the total value of imports (Central Bank of the Republic of Kosovo, 2011, p. 10, 16, 79-80; International Monetary Fund, 2011, p. 185).

Production

Production of lead concentrate increased by 92%; zinc concentrate, by 63%; limestone, by 20%; and lead and zinc ore, by 18%. Ferronickel production was estimated to have increased by 10%. Clay production decreased by 59%; sand and gravel, by 30%; nickel ore, by 15%; and silica sand, by 14% (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Outlook

Kosovo is expected to remain a modest producer of mineral commodities but is likely to continue to increase production as the economy develops and further repairs are made to infrastructure damaged in the conflict in the late 1990s. Further development of the Trepca Complex could make Kosovo a regionally significant producer of lead and zinc, but major investments would be necessary to accomplish this goal.

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[1]Where necessary, values have been converted from European Union euros (EUR) to U.S. dollars (US$) at the rate of EUR0.76=US$1.00.

[2]"Mineral products" included industrial minerals, minerals fuels, and metal ores, but not processed metals.

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TABLE 1

KOSOVO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Ferroalloys, ferronickel:[e]						
Gross weight		--	3,500 [r]	24,300 [r]	27,700 [r]	30,400
Ni content of ferronickel		--	800	5,600 [r]	6,360 [r]	7,000
Lead-zinc:						
Ore, gross weight		63,517	69,953	139,670	158,137 [r]	185,842
Lead content of ore		2,760	3,040	6,080	6,740 [r]	7,660
Zinc content of ore		2,230	2,460	4,900	5,590 [r]	6,450
Concentrate, gross weight:						
Lead concentrate		--	--	--	4,285	8,232
Zinc concentrate		--	--	--	5,332	8,678
Metal:						
Pb, refined		--	--	--	4,250	4,300 [e]
Zn, refined		--	--	--	5,487	5,500 [e]
Nickel:						
Ore, wet		--	145,882	292,362	918,709 [r]	779,506
Ni content of ore (1.25%)		--	1,820	3,660	10,500 [r]	9,080
INDUSTRIAL MINERALS						
Cement[e]	thousand metric tons	450	470	590	600	600
Clay, bentonite[3]		--	16,200	20,800	49,000 [r]	20,250
Limestone	cubic meters	NA	NA	1,917,196	2,164,589 [r]	2,606,047
Marl	do.	254,386	260,707	322,007	291,829 [r]	302,630
Pumice and related materials, volcanic tuff	do.	NA	NA	45,005	58,788	60,000 [e]
Sand and gravel, excluding glass sand	do.	34,268	41,621	44,498	13,586 [r]	9,577
Silica sand (glass sand)	do.	NA	NA	27,325	20,181 [r]	17,333
MINERAL FUELS AND RELATED MATERIALS						
Lignite	thousand metric tons	6,532	6,715	7,842 [r]	7,871 [r]	7,958

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]Table includes data available through July 25, 2011.

[2]In addition to commodities listed, other aggregates and construction materials were believed to have been produced, but available information is inadequate to make reliable estimates of output.

[3]Estimate based on reported production in cubic meters: 2007—27,614; 2008—35,382; 2009—83,294 (revised); and 2010—34,425.

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TABLE 2
KOSOVO: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Bauxite	Bauxite Mine Volljak (Government owned)	Grebnik Mine, about 50 kilometers east of Pristina and 17 kilometers north of Orahovac	NA
Cement	Sharr Beteiligungs GmbH (Titan Group)	Hani Elezit, on border with Macedonia	600
Coal, lignite	Kosovo Energy Corp. J.S.C. (Government owned)	Bardh and Mirash Mines, just west of Pristina	NA
Kaolin	Kaolini LLC	Karacevo, Gjilan municipality	NA
Lead and zinc:			
Ore	Trepca Complex (Government owned)	Artana Mine at Novo Brdo	NA
Do.	do.	Stan Terg Mine	NA
Do.	do.	Belo Brdo Mine, northern Kosovo	NA
Do.	do.	Hajvalia Mine, 8 kilometers southeast of Pristina	NA
Do.	do.	Crnac Mine, northern Kosovo	NA
Concentrate	do.	Concentrator at Tuneli i Pare near Mitrovica	NA
Do.	do.	Concentrator at Leposavic in northern Kosovo	NA
Do.	do.	Concentrator at Kizhnica, about 8 kilometers southeast of Pristina	NA
Metal:			
Lead	do.	Lead smelter at Zvecan	NA
Zinc	do.	Zinc smelter at Mitrovica	NA
Magnesite	XIM Strezoc Magnesite Mine LLC ("Iminggrup mgo" Sh.p.k.)	Mine and processing plant in Strezovce, Kamenica municipality	NA
Do.	Mine and Industry of Magnesite Goleshi LLC ("Iminggrup mgo" Sh.p.k.)	Magure, Lipljan municipality	NA
Nickel:			
Ore	Ferronikeli (Cunico Resources NV)	Mines at Chikatovo (Dushkaja and Suke Mines) and Glavitca	NA
Metal[1]	do.	Ferronickel plant at Gllogovac, about 20 kilometers west of Pristina	12

Do., do. Ditto. NA Not available.
[1]Nickel in ferronickel.

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The Mineral Industry of Kyrgyzstan

By Elena Safirova

Kyrgyzstan has a variety of mineral resources (ferrous and nonferrous metals, including precious metals and rare earths; industrial minerals, semiprecious stones, and uranium). Prior to the proclamation of Kyrgyz independence in 1991, mining was an important part of the economy of the Soviet Republic; in the past two decades, however, the variety of mined minerals was reduced. In 2010, gold accounted for more than 90% (in terms of value) of the minerals mined in the country. Other minerals being mined included antimony, cement materials, clay, coal, fluorspar, gypsum, limestone, mercury, natural gas, oil, sand and gravel aggregates, silica, and silver. Kyrgyzstan has deposits of other minerals that were not being mined. They include arsenic, bauxite, copper, iron ore, lead, rare-earth metals, sulfur, tin, tungsten, and zinc. Uranium was in high demand during the Soviet period, which ended in 1991, but was no longer mined in the country because of the negative environmental consequences of uranium production (Russian American Chamber of Commerce in the USA, 2007; Celestial Mountains Travel Encyclopedia of Kyrgyzstan, 2012; U.S. Central Intelligence Agency, 2012; Welcome.kg, 2012).

Kyrgyzstan has significant reserves of coal but only limited reserves of oil and gas, and the country relied on imports of fossil fuels. Most natural gas imports came from Uzbekistan. Kyrgyzstan is rich in hydropower, and more than 90% of domestically consumed electricity was generated by hydroelectric powerplants. Kyrgyzstan also exported hydropower to Kazakhstan and Uzbekistan in return for fossil fuels. The country's antiquated electric grid and often inefficient management practices made the country more dependent on foreign oil when water levels were low (Library of Congress, 2007).

Production

In 2010, the nominal gross domestic product (GDP) decreased by 2% compared with that of 2009 to $4.49 billion. Industrial production, on the other hand, increased by 9.8% compared with that of 2009. In 2010, the production value of the mineral industry decreased by 0.4% compared with that of 2009 because of the decrease in the mining of nonfuel minerals. Also, the share of the mineral industry in total industrial production decreased to 1.9% from 2.1% in 2006 (Natsional'nyi Statisticheskiy Komitet Kirgizskoi Respubliki, 2011, p. 6, 7, 8; U.S. Department of State, 2012). Data on mineral production are in table 1.

Commodity Review

Metals

Gold.—Despite Kyrgyzstan's significant potential for further exploration and development, in 2010, there were only two gold mines operating in the country. One of them, the Kumtor gold mine, is located in the southern Tien Shan metallogenic belt, which traverses Central Asia. The belt includes a number of mesothermal-type gold deposits, such as the Jilau, the Kumtor, the Muruntau, and the Zarmitan deposits. Kumtor is located about 350 kilometers (km) southeast of Bishkek and about 60 km north of the border with China.

The Kumtor Mine was operated by Canadian company Centerra Gold Inc. In 2010, Centerra Gold produced 5.765 million metric tons (Mt) of gold ore and extracted 568,000 troy ounces (17.7 t) of gold content. Up to the end of 2009, the Kumtor deposit had been operated by another Canadian company, Cameco Gold Inc. Since 1992, Cameco and the Government had jointly owned Kumtor Gold Co.; the Kyrgyz Government held two-thirds of the company shares and Cameco held the other one-third. In April 2009, Centerra Gold negotiated an agreement with Comeco and the Government, and in December 2009, Centerra Gold became the sole owner of Kumtor Gold. Mining operations at Kumtor were conducted using conventional open pit methods. The overall waste-to-ore ratio in 2010 was 19.2:1 (MetalDaily.ru, 2011; Centerra Gold Inc., 2012).

The second gold mine in Kyrgyzstan, the Makmal Mine, was operated by OAO KyrgyzAltyn and was wholly owned by the Kyrgyz Government. The Makmal Mine was located 630 km from Bishkek in the Djalalabad region. The mine had been operated using open pit methods from 1986 to 2003. After 2003, the production volumes at Makmal were very low. As of 2010, the gold reserves of the mine were approaching depletion, and KyrgyzAltyn was developing plans to mine the deposit using underground methods to extend the life of the mine to 2016. Currently, the average production from the mine was about 1.1 million metric tons per year of ore (KyrgyzAltyn, 2011).

Mercury.—The Khaydarkan mercury mining and metallurgical complex continued to mine the Khaydarkan and the Novoye deposits. The complex included two underground mines, a beneficiation plant, and a metallurgical processing facility. As recently as in 2000, the plant's annual production level was 500 to 600 t of mercury, but in 2010, it had decreased to about 250 t. The mercury plant was located in the mountainous settlement of Khaydarkan on the Alay ridge of the Tien Shan mountains. The settlement had a population of 11,000, and the people depended largely on the mine for their livelihood. Alternative employment opportunities were very limited, but the amount of toxic waste generated by processing mercury ore over the years made the environmental situation in the settlement potentially dangerous for the residents. The most common types of waste were burrow, cinder, and tailings. Although no detailed studies had been conducted, environmental advocates were concerned that the concentrations of mercury in the air and water were elevated and that the health of the local population could be endangered. In 2009, the Government announced a decision to conditionally close the mine, but no information on whether the mine had indeed been closed was available (Noruzbaev, 2009).

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Outlook

Kyrgyzstan is actively trying to attract foreign investment into its mineral industry. Whereas a majority of foreign companies continue to direct their efforts at exploration of gold deposits (for example, new gold mines are planned at Jerooy and Taldy-Bulak), other mineral resources (especially antimony, rare earths, and uranium) are also likely to attract the interest of foreign investors in the future. Kyrgyzstan's experience in other sectors of the economy (for example, agriculture) suggests that it can efficiently reform its legal system in the direction of a market economy and well-functioning land and resource markets (U.S. Agency for International Development, 2010). At the same time, the recent political unrest at mines in Talas Province is likely to caution investors who intend to work in Kyrgyzstan (Minerjob.ru, 2010).

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TABLE 1

KYRGYZSTAN: PRODUCTION OF MINERAL COMMODITIES[1,2]

(Metric tons unless otherwise specified)

Commodity	2006	2007	2008	2009	2010
METALS					
Antimony:					
Mine output, Sb content[e]	50	10	10	10	10
Metal and compounds	100	150 [e]	242	918	1,000 [e]
Gold, mine output, Au content kilograms	10,721	10,559	18,132	16,950	18,300 [e]
Mercury:					
Mine output, Hg content[e]	250	250	250	250	250
Metal kilograms	168,900	331,500	290,000 [e]	320,000	330,000 [e]
Molybdenum, mine output, Mo content[e]	250	250	250	250	250
INDUSTRIAL MINERALS					
Cement	1,059,900	1,229,500	1,218,100	579,400 [r]	600,000 [e]
Fluorspar, concentrate[e]	4,000	4,000	4,000	4,000	4,000
Kaolin[e]	400,000	400,000	400,000	400,000	400,000
Lime, dead-burned	9,900	12,900	8,700	4,700 [r]	7,800
Salt[e]	1,100	1,100	1,100	1,100	1,100
Sands cubic meters	514,800	597,900	836,200	800,000 [e]	850,000
MINERAL FUELS AND RELATED MATERIALS					
Coal:					
Bituminous	45,359	37,195	55,338	67,132	70,000 [e]
Lignite	275,784	358,338	437,263	535,239	550,000 [e]
Total	321,143 [r]	395,533 [r]	492,601 [r]	602,371 [r]	620,000 [e]
Natural gas thousand cubic meters	25,700 [r]	18,200 [r]	29,700 [r]	15,400 [r]	13,600 [e]
Petroleum, crude:					
In gravimetric units	70,900	68,500	71,000	77,300 [r]	85,000 [e]
In volumetric units[e] 42-gallon barrels	515,000	498,000	516,000	562,000	618,000
Uranium, processed:					
U content	NA	NA	1,097	2,574	NA
U_3O_8 content	NA	NA	1,309	3,071	NA

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. NA Not available.

[1]Table includes data available through March 20, 2012.

[2]In addition to the commodities listed, Kyrgyzstan is thought to produce a number of other mineral commodities, including clays, gypsum, sand and gravel, and silver, but available information is not adequate to estimate production.

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TABLE 2

KYRGYZSTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Antimony:			
Sb content of ore	Kadamzhay complex (ATF Invest, a subsidiary of ATF Bank of Kazakhstan, 70.4%), which included the Kadamzhay Mine and the Terek-Sayskiy Mine	Kadamzhayskiy Rayon	2,400 [2]
	Khaydarkan mining and metallurgical complex	Khaydarkan region	
Metal and compounds	Kadamzhay metallurgical facility (ATF Invest, a subsidiary of ATF Bank of Kazakhstan, 70.4%)	Kadamzhayskiy Rayon	28,000
Cement	Kantskiy cement plant	Kant	1,500,000
Coal	Seven underground mines and five open pits among the following deposits: Almalyk, Dzhergalan, Kara-Kiche-Kok-Yangak, Kyzyl-Kiya, Sulyukta, and Tashkumyr	Southwestern, central, and northeastern parts of the country	2,200,000 [2]
Fluorspar, concentrate	Khaydarkan mining and metallurgical complex	Khaydarkan deposit	5,000
Gold:			
Au content of ore	Kumtor Gold Co. (Centerra Gold Inc.)	Kumtor deposit	22
Do.	OAO KyrgyzAltyn	Makmal deposit	3
Do. kilograms	Solton-Sary Mine	Naryn	500
Do.	Talas Gold	Dzheryuy-Bashi, Pereval; Talasskay Oblast'	NA
Do.	Taldybulak Levoberezhny deposit	NA	NA
Au content of ore, open pit	Kyrgyzaltyn-Noroks Mining Company JV	Dzher-Uy deposit	NA
Au content of ore, underground	do.	do.	NA
Refined	Kara-Balta refinery	Chuskaya Oblast'	NA
Mercury:			
Hg content of ore	Khaydarkan mining and metallurgical complex	Khaydarkan and Novoye deposits	700 [2]
Metal	do.	do.	1,000
Molybdenum, for nonmetallurgical uses	Kara-Balta mining and metallurgical complex	NA	NA
Do.	Molibden Joint Stock Co.	Chuskaya Oblast'	NA
Natural gas million cubic meters	Kyrgyzazmunayzat	Approximately 300 wells; Changyr-Tash, Chigirchik Pereval, Izbaskentskoye, Kara-Agach, Mayluu-Suu, Susahoye, and Togap-Beshkenskoye deposits (major)	100 [2]
Petroleum	do.	do.	150,000
Do.	Kyrgyz Petroleum Co.	Dzhalal-Abadskaya Oblast'	NA
Rare earths:			
Ore	Aktyuzskiy mining directorate	Kutessai II and Aktyuz-Boordu deposits	300,000
Rare-earth metals	Kyrgyz chemical and metallurgical plant	Orlovka	800
Silver	Karagoyskoye deposit	Oshskaya Oblast'	NA
Do.	Kumyshtag deposit	Talasskaya Oblast'	NA
Tin	Enil'chek JSC mining enterprise	Atdzhaylau deposit	150
Do.	do.	Trudovoye deposit	350
Do.	Tyanshanolovo mining and beneficiation complex	Sary-Dzhas field	NA
Do.	Uchkoshkon deposit	do.	NA
Tungsten	Enil'chek JSC mining enterprise	Atdzhaylau deposit	90
Do.	do.	Trudovoye deposit	95,600
Uranium, processed	Kara-Balta uranium mill (Renova Group)	Zarechnoye deposit, Chuskaya Oblast'	3,600
Do.	Linia Prava (LPU) (Nimrodel Resources, 100%)	Southern Fergana Valley, Batkenskaya Oblast'	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

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THE MINERAL INDUSTRY OF LATVIA

By Mark Brininstool

In 2010, Latvia's gross domestic product (GDP) decreased by 0.3% compared with that of 2009. Latvia's GDP decreased by 4.2% in 2008 and by 18.0% in 2009 after the onset of the world economic crisis in 2008, but for the 3 years previous to that (2005 through 2007), the country had experienced 10% to 15% per year rates of growth in the GDP. Latvia produced mainly industrial minerals and was not a significant world producer of any mineral commodities, but it had the Baltic States' only steel mill, JSC Liepajas Metalurgs (International Monetary Fund, 2011, p. 185).

The sole cement producer in Latvia, SIA CEMEX, constructed a new kiln at its Broceni cement plant and increased the production capacity to 1.2 million metric tons per year. The project was completed in May 2009. The estimated increase in production of cement in table 1 is based on the assumption of an initial increase in production at SIA CEMEX in 2009 and full production in 2010 (CEMEX S.A.B. de CV, 2012).

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TABLE 1
LATVIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons)

Commodity	2006	2007	2008	2009	2010
Cement:					
Clinker	NA	NA	NA	NA	NA
Portland cement[e]	280,000	300,000	310,000	650,000 [r]	1,100,000
Crushed rock	137,023	937,030	507,591	500,000 [e]	500,000 [e]
Dolomite, crude (excluding calcined, crushed dolomite aggregate)	1,688,643	5,730,865	2,305,065	929,070	930,000 [e]
Gravel, pebbles, shingle and flint of a kind used for concrete aggregates, for road metalling, or for railway and other ballast	3,824,965	5,759,249	6,011,735	5,195,972 [r]	4,640,317
Gypsum[e]	230,000	230,000	230,000	230,000	230,000
Limestone	NA	NA	NA	NA	NA
Peat	931,103	820,996	923,404	1,163,803	1,119,417
Sand and gravel	2,132,779	4,284,684	2,222,504	2,292,848	2,300,000 [e]
Sand, construction	1,936,000	3,601,000	2,153,000	1,314,535	1,320,000 [e]
Silica sand, industrial[e]	12,600	13,000	12,000	12,000	12,000
Steel, crude[e]	550,000	550,000	550,000	550,000	550,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA Not available.
[1]Table includes data available through February 6, 2012.

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THE MINERAL INDUSTRY OF LITHUANIA

By Mark Brininstool

In 2010, Lithuania's gross domestic product (GDP) increased by 1.4% compared with that of 2009. The GDP decreased by 14.8% in 2009. Mining and quarrying activities made up only about 0.3% of the GDP. Lithuania was not a significant world producer of any mineral commodities, but crude petroleum and petroleum products made up a significant portion of the country's foreign trade value. In 2010, petroleum and petroleum products accounted for 26% of the total value of Lithuania's imports and 22% of the total value of exports. AB Orlen Lietuva, which was located near Mazeikiai, was the only petroleum refinery operating in the Baltic States; the refinery exported 82% of its refined petroleum production (Statistics Lithuania, 2011, p. 284–286, 381–382, 526; AB Orlen Lietuva, 2012).

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TABLE 1
LITHUANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity	2006	2007	2008	2009	2010
Cement	1,065,367	1,105,365	1,075,581	583,100	843,000
Common clays and shales for construction use	385,275	384,850	624,470	246,398	250,000
Crushed granite	874,000	846,000	810,000	327,000 r	307,000
Crushed stone used for concrete aggregates, for roadstone and for other construction use	5,247,978	6,401,662	6,896,987	2,426,773	2,500,000 e
Dolomite, crude (excluding calcined, crushed dolomite aggregate)	10,455	2,131	4,752	2,000 r,e	2,000 e
Granules, chippings, and powder of stones, excluding marble	10,390	21,885	15,538	6,222	6,200 e
Limestone	1,776,300	1,754,000	1,625,089	911,900 r	928,000
Peat:					
Horticultural use	471,000	307,000	521,000	542,500	326,800
Fuel use e	50,000	15,000	15,000	15,000	15,000
Petroleum:					
Crude	180,894	154,449	127,658	115,000	114,500
Refinery products	7,709,800	5,263,500	8,814,800	8,012,300	8,579,400
Sand and gravel:					
Construction sand	4,342,743	5,085,839	5,055,172	3,100,000 r	3,104,000
Gravel, pebbles, shingle and flint	3,290,568	4,095,713	4,414,239	1,930,000 r	2,551,000
Silica sand, industrial	42,600	45,400	38,300	41,200	67,000
Sulfur	61,135	42,618	73,870	69,722 r	73,500
Sulfuric acid	1,118,200 r	1,144,600 r	1,051,400 r	1,155,849 r	1,150,000 e

eEstimated; estimated data are rounded to no more than three significant digits. rRevised.

[1]Table includes data available through February 6, 2012.

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The Mineral Industry of Macedonia

By Mark Brininstool

Macedonia produced a number of metals, as well as industrial minerals and lignite. Petroleum was imported and processed at the country's sole domestic refinery. Production of mineral products was not significant on either a world or regional scale, but exports of metal commodities were a relatively important source of trade revenue for Macedonia (table 1).

Minerals in the National Economy

Macedonia's real gross domestic product (GDP) increased by 1.8% compared with the GDP in 2009. In 2009 (the latest year for which data were available), manufacturing made up 14.12% of the GDP and mining and quarrying made up only 1.0%. In 2010, mineral fuels, lubricants, and related materials made up 17.7% of the value of Macedonian imports and 7.8% of the value of exports. Macedonia's State Statistical Office listed ferronickel, flat-rolled steel products, and petroleum products as three of the country's four most significant export items, although data concerning the value of the trade of these goods in 2010 were not available (Republic of Macedonia State Statistical Office, 2011a, p. 35; 2011b, p. 17; 2011c, p. 1–2).

Production

Estimated production of ferrosilicon increased by 422%; gypsum, by 68%; dolomite, by 46%; limestone flux, by 21%; nickel content of ferronickel, by 17%; and dimension stone, by 14%. The large estimated increase in ferrosilicon production was owing to the restarting of the ferroalloys plant at Jegunovce in May (production was halted in November 2009) after the plant was purchased by Metal Invest EFT DOOEL in February. Production of ferromanganese and silicomanganese were also likely restarted in 2010. In previous years, Macedonia's State Statistical Office reported production volumes for the majority of the mineral commodities produced in Macedonia, but in 2010, production volumes for most mineral commodities were not reported. Consequently, the majority of production figures for 2010 are estimated in table 1 (SeeNews, 2010a, b).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Outlook

Macedonia's mineral commodity production will most likely remain modest. World economic conditions could have a significant effect on Macedonia's mineral industry owing to foreign demand for metals and petroleum products. The level of lignite production will most likely remain relatively constant to maintain electricity production.

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TABLE 1

MACEDONIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Copper, mine and concentrator output:						
Ore, gross weight	thousand metric tons	4,132	4,109	4,240	3,767	3,800
Concentrate:						
Gross weight		33,591	33,467	38,337	35,430	36,600
Cu content[e]		7,000	7,400	8,400	7,600	7,900
Iron and steel:						
Ferroalloys:						
Ferromanganese		--	--	12,623	--	10,000
Ferronickel (23% Ni), gross weight[e]		47,600 r	66,600 r	65,300 r	52,200 r	60,900
Ferrosilicon		59,023	34,215	42,674 r	7,657	40,000
Silicomanganese		--	70,472	54,931	--	15,000
Total		107,000 r	171,000 r	176,000 r	59,900	126,000
Steel:						
Crude, secondary		360,304	371,930	252,461	276,215	292,126 [3]
Semimanufactures		353,964	366,076	252,946	270,397	275,196 [3]
Lead, mine output, concentrate, Pb content		9,000 r	29,000 r	34,000	51,000 r	46,000 [3]
Nickel, Ni content of FeNi		10,942	15,321	15,026	12,000	14,000
Zinc, mine output, concentrate, Zn content		11,000	24,000 r	29,000 r	35,000 r	35,000 [3]
INDUSTRIAL MINERALS						
Cement	thousand metric tons	924	945	916	909	900
Clays, bentonite		32,507	35,234	22,890	15,350	15,400
Dolomite:						
Not frayed, not calcined		119,109	96,723	75,855	78,523	115,000
Sintered		20,054	19,351	23,933	21,607	22,000
Agglomerated		--	3,337	4,179	3,814	4,000
Feldspar, crude		32,824	32,814	28,920	19,377	19,000
Gypsum, crude		267,760	255,500	242,400	154,550	260,000
Lime		12,704	7,517	--	2,713	2,700
Limestone flux		622,829	848,498	827,100	694,968	840,000
Marl		1,059,872	1,112,870	1,083,830	560,170	600,000
Pumice and related materials, volcanic tuff		66,987	80,910	103,476	113,064	113,000
Sand and gravel, excluding glass sand	cubic meters	42,696	30,020	39,559	30,631	30,600
Silica sands (quartz sands or industrial sands)	do.	113,240	97,432	84,969	72,313	72,300
Stone, excluding quartz and quartzite:						
Dimension, crude		65,569	60,271	71,819	69,082	78,603 [3]
Crushed and broken	cubic meters	111,829	58,369	33,023	34,436	34,400
Talc, crude		1,025	1,775	977	--	--
MINERAL FUELS AND RELATED MATERIALS						
Lignite	thousand metric tons	6,722	6,569	7,746	7,454	7,450
Petroleum, refinery products[e, 4]	thousand 42-gallon barrels	8,200	8,300	8,300	7,700	7,700

[e]Estimated, data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through August 16, 2011.

[2]In addition to commodities listed, secondary aluminum in small amounts, common clay, diatomite, and gold contained in copper concentrate also are thought to have been produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Figures were converted to barrels from production in thousand metric tons, which was reported as the following: 2006—1,022; 2007—1,042; 2008—1,036; 2009—963; 2010—Not reported.

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TABLE 2
MACEDONIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement	Usje Cementarnica AD (Titan S.A., 95%)	Plant at Skopje	1,000 e
Copper ore	Bucim Mine (Solway Investment Group Ltd.)	Mine and mill at Bucim, west of Radovis	4,000
Ferroalloys:			
Ferrosilicon	Metal Invest EFT DOOEL	Plant at Jegunovce	80
Silicomanganese	Skopski Leguri DOOEL	Plant at Skopje	56
Ferromanganese	do.	do.	66
Ferronickel, Ni content of ferronickel	Feni Industries (Cunico Resources)	Ferronickel plant at Kavadarci	16 e
Gold, mine output	Bucim Mine (Solway Investment Group Ltd.)	Mine and mill at Bucim, west of Radovis	NA
Lead, metal	MHK d.o.o. Zletovo	Imperial smelter at Titov Veles	NA
Do.	do.	Refinery at Titov Veles	NA
Lead-zinc, concentrate	Sasa Mine (Solway Investment Group Ltd.)	Mill at Sasa, north of Makedonska Kamenica	NA
Lead-zinc ore	do.	Mine at Sasa, north of Makedonska Kamenica	1,000 e
Do.	Zletovo Mine (Indo Minerals and Metals DOOEL)	Mine and mill near Probistip	NA
Do.	Toranica Mine (Indo Minerals and Metals DOOEL)	Mine near Dolga Livada	NA
Lignite	AD ELEM (State owned)	Mine at Suvodol	6,500
Do.	do.	Mine at Oslomej	1,000
Do.	do.	Star Rudnik Mine at Oslomej	310 e
Do.	do.	Brod-Gneotino Mine, south of Suvodol near Brod	NA 1
Nickel, ore	Feni Industries (Cunico Resources)	Opencast mine at Rzanovo, 20 miles south of Kavadarci	NA
Petroleum, refined 42-gallon barrels	OKTA A.D. Skopje (EL.P.ET Balkanike, 81.51%)	Oil refinery at Skopje	20,000 e
Steel, crude, secondary	Makstil A.D. Skopje (Duferco Group, 62%)	Plant at Skopje	360
Zinc, metal	MHK Zletovo	Imperial smelter plant and refinery at Titov Veles	NA

eEstimated. Do., do. Ditto. NA Not available.
1In 2009 (the latest year for which data were available), the Brod-Gneotino Mine remained under development and did not produce any coal. AD ELEM expected the mine to have a production capacity of 2,000,000 metric tons per year when development is complete.

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The Mineral Industry of Malta

By Harold R. Newman

The Maltese archipelago consists of three inhabited islands—Malta [which covers an area of 245 square kilometers (km^2)], Gozo (67 km^2), and Comino (2.8 km^2)—and four other uninhabited islands. Malta's political and strategic importance has traditionally been linked to its geographic position in the center of the Mediterranean Sea and its natural deepwater harbor. The Maltese islands are relatively young geologically; the oldest rocks date back to the Tertiary Period some 30 to 35 million years ago and are for the most part composed of marine sedimentary rocks (Euro-Mediterranean Information System, 2010).

The mineral industry, which consisted mainly of limestone and salt production, did not contribute significantly to the gross domestic product. The Malta Resources Authority (MRA) is a public corporate body with regulatory responsibilities relating to energy (including petroleum exploration), mineral resources (including quarry operations), and water (including the regulation of energy and water utilities) in the Maltese islands. The MRA was set up by the Maltese Parliament through the Malta Resources Authority Act of 2000 (Malta Resources Authority, 2010a).

The mineral-related economy of the country depended mainly on trade and the storage of crude oil in the Malta Freeport. Malta Freeport Terminals Ltd. was established to develop the Malta Freeport to offer modern transshipment facilities, storage, and assembling and processing operations, including an oil terminal with bunkering facilities. The transshipment and reexport of goods in 2010 continued to be significant to the country's economy. In 2010, the Malta Freeport handled almost 2.4 million 20-foot (ft) equivalent units (TEUs). A TEU is a 20 ft by 8 ft by 8 ft intermodal shipping container. A standard 40 ft by 8 ft by 8 ft container equals two TEUs. The Freeport's infrastructure comprised an operational 2-km-long quay, a dredged water depth along all mainline berths of 15.5 meters (m), and a total area of 615,000 square meters for container storage. In 2010, Malta continued to be an important transshipment center in the Mediterranean area (Malta Freeport Terminals Ltd., 2010).

In 2010, Malta's total exports were valued at an estimated $2.5 billion and total imports were valued at an estimated $3.9 billion. Exports to Malta from the United States in 2010 were valued at $424 million. U.S. imports from Malta in 2010 were valued at $264 million. The European Union countries as a group were Malta's principal trading partners (U.S. Census Bureau, 2010a, b).

Production

Malta has few natural resources, and the only exploited mineral resources in 2010 were limestone and evaporated (solar) salt. Quarrying was done mainly by small family-operated businesses, as were the solar salt operations.

Two types of limestone were quarried, both by open pit. Limestone known locally as Franka, or softstone, was quarried from the Lower Globigerina Limestone Formation and was the main material for building construction. Limestone known locally as hardstone was quarried from the Lower and Upper Coralline Limestone Formations. These deposits produce crushed aggregates and a harder material known locally as Malta Marble that can be polished and used for tiling (Malta Environment and Planning Authority, 2010).

Malta depended almost completely on imports of raw materials and fuels. All mineral production was for domestic consumption (table 1).

Structure of the Mineral Industry

Several small stone quarries were in operation on Gozo and Malta islands. Available information regarding ownership, production, capacity, and location, however, was inadequate to prepare a Structure of the Mineral Industry table for Malta.

Commodity Review

Mineral Fuels

Petroleum.—The Oil Exploration Department (OED) of the MRA implements and administers the provisions of the Petroleum Production Act, Chapter 156, as amended; the Continental Shelf Act, Chapter 194, as amended; and the Petroleum (Production) Regulations, Subsidiary Legislation 156.01, as amended. The OED administers related petroleum exploration activities, including promoting exploration, analysis of data, keeping of samples and data, monitoring contractual obligations, and overseeing exploration activity on Malta's continental shelf. Malta's exclusive economic zone has an extensive marine area that neighbors the areas offshore Libya and Tunisia and is in the same geologic province (Malta Resources Authority, 2010b).

Heritage Oil plc of the United Kingdom entered into a production-sharing contract (PSC) with the Government for a 100% interest in Areas 2 and 7 in the southeastern offshore region of Malta in 2007. The licenses cover about 18,000 km^2 and were located off the southeastern coast of Malta in water depths of about 200 to 400 m. The licenses were not well explored; the only well had been drilled in 1980, and that well failed to reach the target horizons. Areas 2 and 7 are close to a number of producing wells offshore Libya and Tunisia (Heritage Oil plc, 2010).

Leni Gas & Oil plc (LGO) of the United Kingdom was an international oil and gas exploration, development, and production company. LGO (10% interest) and Mediterranean Oil & Gas plc (90% interest) had established a joint venture to explore offshore southern Malta in Area 4, Blocks 4, 5, 6, and 7. The joint venture planned to initiate drilling in one of the blocks

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by July 2011. Four prospects and five leads have been delineated in a 5,700-km^2 area. The joint venture was undertaking various geoscience studies and data acquisition surveys to firm up the proposed drill targets. Area 4 was governed by a PSC with the Government and included a commitment to drill by July 2011 (Energy-pedia News, 2010)

Outlook

Malta's entrepôt activities in the Mediterranean area are expected to continue, as is the country's offshore exploration for petroleum. Industrial minerals will likely continue to be produced for domestic consumption.

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TABLE 1

MALTA: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Cubic meters)

Commodity[3]	2006	2007	2008	2009	2010
Limestone	1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Salt	6,000	6,000	6,000	6,000	6,000

[1]Estimated data are rounded to no more than three significant digits.

[2]Table includes data available through April 30, 2011.

[3]In addition to commodities listed, small amounts of cement, fertilizer, lime, and plaster are produced, but available information is inadequate to make reliable estimates of output.

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The Mineral Industry of Moldova

By Elena Safirova

Moldova had a small mineral industry that was primarily engaged in the mining and production of industrial minerals and mineral products, including cement, clays, gypsum, limestone, and sand and gravel. The country was dependent on imports for all its coal, natural gas, and oil supplies, which came mainly from Russia (U.S. Central Intelligence Agency, 2012). Moldova's main mineral resources were industrial minerals used to produce construction materials and as input for the cement, chemical, food processing, and glass industries. Small deposits of iron ore, natural gas, and oil had been explored but were not found to be economic to develop (U.S. Department of State, 2011).

Production

In 2010, Moldova's gross domestic product (GDP) in current prices was 71.8 billion lei (or $5.81 billion[1]). This constituted an increase of 6.9% compared with that of 2009. Industrial production accounted for 13.3% of the total GDP. Compared with that of 2009, total industrial production in 2010 increased by 7.0%, mining and quarrying increased by 5.6%, and production by the metallurgical industry increased by 19.5% (National Bureau of Statistics of the Republic of Moldova, 2011a, b). Data on mineral production are in table 1.

Structure of the Mineral Industry

Table 2 lists all major mineral industry facilities.

Commodity Review

Metals

Iron and Steel.—In 2010, OAO Moldovan Metallurgical Plant, which is located in the Transnistria region, continued to struggle amidst the economic crisis. Production of crude steel decreased by 43.3% compared with that of 2009 to a new low of 241,000 metric tons (t), and stayed very much below the plant's capacity level of about 1.1 million metric tons (Mt). The production of rolled steel decreased by 47.5% from the 2009 level to 231,400 t (MetalDaily.ru, 2011; OJSC Moldova Steel Works, 2012).

Industrial Minerals

Cement.—Despite the global economic crisis, cement production in 2010 increased by 28.6% and reached an estimated figure of 900,000 t. The two major cement producers in Moldova were Lafarge Ciment Moldova SA, which was located in the northern part of Moldova, and Rybnitsa Cement Complex, which was located in the Transnistria region. Nevertheless, cement producers continued to struggle. The Rybnitsa Cement Complex reportedly produced only 330,000 t and was working at about 30% of its capacity. A significant share of cement produced in Moldova was exported to Russia, other countries of the former Soviet Union, and the European Union (Kol'tsova, 2011).

Outlook

In the course of the next 2 to 3 years, the industry of Moldova, including the mineral industry, is likely to return to prerecession production levels. In the long run, however, the country is likely to remain a small producer of a very limited set of mineral commodities, predominantly industrial minerals. A significant problem Moldova could face in the future is related to its lack of hydrocarbons, which makes the country dependent on its neighbors for energy. Two possible solutions might be either an increase of domestic exploration activities or investment in renewable energy sources, both of which are costly and have highly uncertain returns. To get rid of its reputation as one of the poorest countries in Europe and to bring back thousands of its citizens now working abroad, Moldova would have to succeed in providing a reliable energy base for its economy (Ratha and others, 2007).

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[1]Where necessary, values have been converted from Moldovan leu (MDL) to U.S. dollars (US$) at the exchange rate of MDL12.36=US$1.00.

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TABLE 1

MOLDOVA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity	2006	2007	2008[e]	2009[e]	2010[e]
METALS					
Steel, crude	675,400	995,000	885,000	425,900 [r, 2]	241,500 [2]
INDUSTRIAL MINERALS					
Cement	837,000	800,000 [e]	750,000	700,000	900,000
Clays, unspecified	227,968	165,040	165,000	150,000	160,000
Gypsum	186,200	311,900	701,200 [r, 2]	164,200 [r, 2]	300,000
Lime	2,153	1,135	1,000	800	900
Limestone	15,333	166,870	165,000	150,000	170,000
Sand and gravel	289,042	272,197	200,000	150,000	195,000
MINERAL FUELS AND RELATED MATERIALS					
Natural gas, dry million cubic meters	56	--	-- [r]	-- [r]	--
Peat, fuel use[e]	475,000	475,000	475,000	475,000	475,000

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. -- Zero.

[1]Table includes data available through March 15, 2012.

[2]Reported figure.

TABLE 2

MOLDOVA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity[e]
Cement	Lafarge Ciment Moldova SA	Rezina	1,100,000
Granite thousand cubic meters	NA	Kosoutskoye deposit	150
Gypsum	CMC-Knauf joint venture	Kirovskoye deposit	850,000
Oil and natural gas:			
Oil	Redeco Moldova Oil and Gas Co.	Valeni oilfield	100,000
Natural gas thousand cubic meters	do.	Victorovca gasfield	5,000
Sand and gravel do.	NA	71 mined deposits	1,000
Steel, crude	OAO Moldovan Metallurgical Plant	Ribnita, Transnistria region	1,100,000

[e]Estimated; estimated data are rounded to no more than three significant digits. do. Ditto. NA Not available.

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The Mineral Industry of Montenegro

By Mark Brininstool

Montenegro's mineral industry included the mining and processing of bauxite, industrial minerals, and lignite. Metal production included primary aluminum smelting and crude steel production. In 2010, Montenegro's real gross domestic product (GDP) increased by an estimated 1.1% compared with that of 2009. In 2009 (the latest year for which detailed national income statistics were available), manufacturing made up about 4.8% of the GDP and mining and quarrying made up only 0.6% (table 1; Statistical Office of the Republic of Montenegro, 2010, p. 69; Central Bank of Montenegro, 2011)

Production

In 2010, production of lignite increased by 102%; bauxite, by 34%; and aluminum, by 28%. Production of most industrial minerals decreased, and lime production decreased by 81%; salt, by 34%; and gravel, by 33%. No alumina was produced in 2010 (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—In October, En+ Group of Russia announced that it had completed the transfer of a 29.36% stake in Kombinat Aluminijuma Podgorica (KAP) to the Government of Montenegro. The transfer of ownership was agreed upon in 2009 as part of a Government assistance program for the plant, which had faced financial losses owing to high production costs and reduced demand and prices for aluminum as a result of the world financial crisis. En+ also stated that by October it had released 1,900 of the 2,400 employees it planned to let go from KAP and the Niksic Bauxite Mines (En+ Group, 2010).

Outlook

Montenegro's mineral production will most likely remain modest. No major mineral resource exploration projects were known to be underway in 2010, so no important new mineral deposits will likely be developed in the near future. Production of metals will most likely remain small even in terms of regional production.

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TABLE 1
MONTENEGRO: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Alumina		236,740	240,186	220,426	58,528	--
Aluminum, metal, ingot, primary		121,762	124,060	107,457	63,960	82,043
Bauxite		659,370	667,053	671,811	45,779	61,205
Iron and steel, crude steel		163,165	173,849	201,623 r	90,404 r	95,000 e
INDUSTRIAL MINERALS						
Gravel	cubic meters	82,933	92,914	146,381	74,368	49,517
Lime		8,118	7,089	9,839	4,497 r	839
Salt (sea water evaporate)		5,000	20,000	25,200	17,000	11,200
Stone, excluding quartz and quartzite, dimension, crude:						
Ornamental (marble blocks)	cubic meters	43,057	51,186	50,084	40,780 r	41,000 e
Crushed and broken	do.	98,360	161,970	179,521	65,015 r	65,000 e
Other, stone products	do.	54,191	60,165	109,436	51,373	39,921
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown		10,000	7,000	--	--	--
Lignite		1,502,334	1,195,515	1,740,076	957,164	1,937,847

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. do. Ditto. -- Zero.

[1]Table includes data available through July 11, 2011.

[2]In addition to the commodities listed, additional industrial minerals were also likely produced, but available information is inadequate to make reliable estimates of output.

TABLE 2
MONTENEGRO: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Kombinat Aluminijuma Podgorica (KAP) (Central European Aluminum Co., 29.365%, and Government of Montenegro, 29.365%)	Podgorica	280
Aluminum, primary	do.	do.	120
Bauxite	Niksic Bauxite Mines (Central European Aluminum Co., 31.82%, and Government of Montenegro, 31.82%)	Kutsko Brdo	700 e
Coal	Rudnik Uglja A.D. Pljevlja	Pljevlja	2,000 e
Steel, crude	Zeljezara Niksic A.D. [(MN Specialty Steels Ltd. (MNSS B.V.)]	Niksic	NA

eEstimated. do. Ditto. NA Not available.

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The Mineral Industry of the Netherlands

By Alberto Alexander Perez

In 2010, the Netherlands continued to be an important regional producer of natural gas and petroleum for the European market and played a major role as a transshipment center for mineral products that entered and left continental Europe. The Netherlands' gross domestic product (GDP) based on purchasing power parity in 2010 was $676.9 billion, which was an increase of 1.7% compared with that of the previous year. The Netherlands was a significant producer of nitrogen and salt, accounting for 1% and 2% of world production, respectively. The country was a modest producer of metallic and nonmetallic minerals and mineral products; however, the main emphasis of the Dutch mineral industry was on trade and processing. The Dutch economy had a strong international focus, as the Netherlands was one of the European Union's (EU's) leading centers of trade and industry. The Port of Rotterdam was the busiest port in Europe in terms of the value and the volume of the cargo handled at the port. Owing largely to its favorable location by the North Sea, the country played a key role as a main port and distribution center for companies operating worldwide. The Netherlands was the EU's fourth ranked exporting country after Germany, France, and Italy, although it ranked only seventh among EU countries in terms of GDP based on purchasing power parity (Apodaca, 2011; Kostick, 2011; Port of Rotterdam Authority, 2011, p. 6, 13; U.S. Central Intelligence Agency, 2011).

Minerals in the National Economy

The Staatstoezicht op de Mijnen [State Supervision of Mines] (SodM) is the agency within the Ministerie van Economische Zaken [Ministry of Economic Affairs] that oversees the production of minerals in the Netherlands and the Netherlands Continental Shelf. The agency is responsible for drafting and enforcing mining, mine safety, and mineral production regulations.

The mineral sector was dominated by natural gas and petroleum production, of which about 40% was from offshore. Mining was confined to the extraction of limestone, peat, and sand and gravel by quarrying and solution mining of salt in the eastern and northern areas of the country. In the nonfuel mineral sector, the Netherlands was engaged principally in downstream activities, including the chemical and metallurgical industries, which used mainly imported ores and industrial minerals (table 1; Staatstoezicht op de Mijnen, 2009).

Production

In 2010, crude steel production increased by 28% and pig iron production increased by 26%. The principal mineral commodities that were produced in the Netherlands were primary aluminum, cadmium, cement, crude petroleum, natural gas, iron and steel, salt, and refined zinc. Rotterdam remained extremely important as a shipping and storage center. In 2010, the throughput (imports and exports) of the following minerals were the most important in terms of total volume: crude petroleum, 100.3 million metric tons (Mt); mineral oil products, 77.6 Mt; iron ore and scrap, 39.8 Mt; and coal, 24.1 Mt. The throughput of crude petroleum, mineral oil products, and iron ore and scrap increased compared with that of the previous year, and the throughput of coal decreased slightly (table 1; Port of Rotterdam Authority, 2011).

Structure of the Mineral Industry

Mineral industry facilities in the Netherlands were mostly privately owned, although the Government continued to be involved in the energy sector through the regulation and oversight of petroleum and natural gas operations. Table 2 is a list of the major mineral industry facilities.

Commodity Review

Metals

Iron and Steel.—In September, Corus officially changed its name in all its operations to Tata Steel Europe, which was a division of the Tata Steel Group. The acquisition of Corus by the Tata Steel Group had been finalized in 2007, but the name was not formally changed until September 2010 (Tata Steel Europe, 2011).

Zinc.—In 2010, Nyrstar NV brought back into full operations its smelter at Budel that had been put on reduced production the previous year. The smelter was producing at near capacity by the end of the year, which helped Nyrstar achieve record zinc production in 2010 of 1.076 Mt (Nyrstar NV, 2011).

Mineral Fuels and Other Sources of Energy

Natural Gas.—Northern Petroleum Plc. announced that the Gessbrug gasfield, which was the second of the four onshore gasfields and two oilfields that the company planned to develop in the Netherlands, began production in January. The Gessbrug gasfield was estimated to be producing at a rate of 7.4 million cubic feet per day, which was the same capacity as the Grollo field when it began production in the previous year. The Geesbrug gasfield, however, is 11 to 15 times the size of the Grollo field and therefore production was expected to increase as more production wells are drilled (Oilbarrel.com, 2011b).

The third field, Brakel, became operational in September and the fourth, the Wijk en Aalburg field, started operations in December. Together, the fields were projected to produce up to 800,000 cubic meters per day at full capacity (Oilbarrel.com, 2011a, c)

Petroleum.—In May 2010, Vitol Tank Terminals B.V. (VTTI) announced plans to expand the storage capacity of its Rotterdam

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terminal to more than 1 million cubic meters with access to rail, truck-loading and barge jetty facilities (Vitol Tank Terminals B.V., 2010).

Renewable Energy.—The Dutch Government continued with its plan to invest about $10 billion in energy supply between 2008 and 2011. Priority was to be given to renewable energy, energy savings, and carbon dioxide reduction to reduce the country's dependence on gas and petroleum (Alexander Gas & Oil Connections, 2008).

Outlook

Natural gas is expected to continue to be the leading sector for attracting investment in the Dutch economy. Although the government's plans to invest in renewable energy remain in place, public and private investment in the development of natural gas fields and the distribution of natural gas are of much greater magnitude. The Netherlands is becoming the leading natural gas distribution center in Europe, and this trend will likely continue. Mineral processing is expected to continue to be the principal factor in the development of the mineral industry in the Netherlands, and in particular the production of aluminum, cement, and steel. The Port of Rotterdam is expected to continue to be a leading European port, particularly in terms of container traffic, and to play a very important role in the European import and export market. Almost as much cargo is expected to pass through Rotterdam as that of the numbers two, three, and four ports in Europe—Antwerp, Hamburg, and Marseille—combined. The trend towards increased use of the port for cargo handling is expected to continue. A significant percentage of the cargo coming into the port would be processed at the port. The Netherlands is expected to continue to be an exporter of natural gas in the region.

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TABLE 1

NETHERLANDS: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum, metal:						
Primary		312,300	301,200 [r]	317,000	300,000	300,000
Secondary[e]		25,000	--	--	--	--
Cadmium, metal, primary		524	495	527	490	490
Iron and steel:						
Pig iron, including blast-furnace ferroalloys (if any)		5,417,000	6,412,000 [r]	5,998,000 [r]	4,601,000 [r]	5,799,000 [3]
Steel:						
Crude		6,372,000	7,368,000	6,880,000	5,194,000 [r]	6,651,000 [3]
Semimanufactures		6,394,000	6,800,000 [e]	6,800,000 [e]	5,100,000	6,500,000
Lead, metal, refined, secondary[e]		17,000	16,000	16,000	16,000 [r]	17,000
Zinc, metal, primary		235,913	231,652	239,500	224,000	220,000
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	2,400	2,400	2,700	2,700	2,700
Magnesium compounds:[e]						
Chloride		25,000	25,000	25,000	25,000	25,000
Oxide		10,000	10,000	10,000	10,000	10,000
Nitrogen, N content of ammonia[e]	thousand metric tons	1,800	1,800	1,800	1,800	1,800
Salt, all types	do.	6,056	6,000 [e]	6,000 [e]	6,000	6,000
Sodium compounds, n.e.s.:[e, 4]						
Carbonate, synthetic		350,000	350,000	350,000	350,000	350,000
Sulfate:						
Natural		20,000	20,000	20,000	20,000	20,000
Synthetic		15,000	15,000	15,000	15,000	15,000
Sulfur, elemental byproduct:						
Of metallurgy		111,000	115,000	115,000	115,000	115,000
Of petroleum and natural gas		400,000	400,000	400,000	400,000	400,000
Total		511,000	515,000	515,000	515,000	515,000
MINERAL FUELS AND RELATED MATERIALS						
Gas, dry natural:						
Gross	million cubic meters	84,000	76,440	76,342	73,700	75,000
Marketed	do.	73,300 [e]	68,166	68,000	68,000 [e]	68,000
Petroleum:						
Crude	thousand 42-gallon barrels	11,426	11,250	12,231	9,300	9,000
Refinery products:						
Liquefied petroleum gas	do.	47,202	15,208 [r]	15,189 [r]	16,018 [r]	16,000
Gasoline, motor	do.	116,559	59,012 [r]	59,442 [r]	60,037 [r]	60,000
Naphtha and white spirit[e]	do.	90,000	90,000	90,000	90,000	90,000
Kerosene and jet fuel	do.	57,375	55,253 [r]	50,868 [r]	46,484 [r]	46,000
Refinery fuel and loss[e]	do.	30,000	30,000	30,000	30,000	30,000
Diesel oil	do.	146,863	145,054 [r]	153,492 [r]	153,556 [r]	150,000
Residual fuel oil	do.	78,375	61,434 [r]	55,626 [r]	54,800 [r]	54,000
Unspecified	do.	202,094	111,774 [r]	116,999 [r]	121,416 [r]	120,000
Total	do.	768,468	567,735 [r]	571,616 [r]	572,311 [r]	566,000

[e]Estimated; data are rounded to no more than three significant digits; may not add to total shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through June 1, 2011.

[2]In addition to the commodities listed, the Netherlands produced construction materials, such as sand and gravel, limestone, and peat, but output was not reported, and information was not available to make reliable estimates of output.

[3]Reported figure.

[4]Not elsewhere specified.

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TABLE 2
NETHERLANDS: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum:				
Billets		Zeeland Aluminium Co. NV (Basemet B.V., a division of Klesch and Co. Ltd., 100%)	Plant at Flushing (Vlissingen)	230
Primary		do.	do.	100
Do.		Aluminum Delfzijl B.V. (Basemet B.V., a division of Klesch and Co. Ltd., 100%)	Smelter at Delfzijl	160
Secondary		Alumax Recycling BV	Smelter at Kerkade	50
Cadmium	metric tons	Nyrstar Budel B.V. (Zinifex Ltd. and Umicore NV)[1]	Plant at Budel-Dorplein	650
Calcium carbonate, ground		Omya Netherlands BV	Plant at Moerdijk	500
Cement		Eerste Nederlandse Cement Industrie NV (HeidelbergCement Group, 100%)	Plants at IJmuiden, Maastrict, and Rotterdam	3,700
Do.		Cementfabriek IJmuiden BV	Three plants at IJmuiden	1,600
Do.		Cementfabriek Rozenburg BV	Two plants at Rozenburg	920
Limestone		Ankerpoort NV (Lhoist SA, 100%)	Mines at Maastricht and Winterswijk	600
Magnesia		Nedmag Industries Mining & Manufacturing BV	Plant at Veendam	130
Do.		MAF Magnesite BV	Plant at Schiedam	40
Natural gas	million cubic meters	Nederlandse Aardolie Maatschappij BV (NAM) (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc., 50%)	Groningen, Leeuwarden, Assen, and other onshore gasfields and several offshore wells in the North Sea	225
Petroleum:				
Crude	42-gallon barrels per day	BP p.l.c., ConocoPhillips Co., and Chevron Corp.	766 wells (204 producing), including the following North Sea fields: Haven, Helder, Helm, Hoorn, Kotter, Logger, and Rijn	83,500
Do.	do.	Nederlandse Aardolie Maatschappij BV (NAM) (Exxon Mobil Corp., 50%, and Royal Dutch Shell plc, 50%)	Onshore fields: Berkel, DeLier, Ijselmonde, Meerkapelle, Pernis, Pinacke, Rotterdam, Schoonebeck, West, Werkendam, and Zoetemeer	20,500
Do.	do.	Veba Oil and Gas Netherlands BV	Hanze field, North Sea	31,500
Refineries		Several companies, of which the four major ones are:	Refineries, including:	1,230,500
Do.		Netherlands Refining Co. (BP p.l.c., 69%, and Chevron Corp., 31%)	Rotterdam	(446,000)
Do.		Shell Nederland Raffinaderij BV	Pernis	(374,000)
Do.		Esso Nederland BV	Rotterdam	(175,000)
Do.		Total Raffinaderij Nederland NV	Vlissingen	(150,000)
Salt		Akzo Nobel Salt BV (Akzo Nobel NV, 100%)	Mines, of which:	4,100
Do.		do.	Hengelo	(2,100)
Do.		do.	Delfzijl	(2,000)
Sand, silica		Sigrano Nederland NV (Sibelco Group)	Mines and plants at Heerlin and Maastricht	500
Do.		Lieben Minërals BV	Mines at South Limburg	150
Sodium:				
Carbonate, synthetic		Brunner Mond Group B.V.	Plant at Delfzijl	380
Sulfate, synthetic		do.	do.	600
Steel		Tata Steel Europe Ltd.	Plant at IJmuiden	7,000
Zinc		Nyrstar Budel B.V. (Zinifex Ltd. and Umicore N.V.)[1]	Plant at Budel-Dorplein	260

Do., do. Ditto.

[1] Nyrstar NV is an independent publicly traded company formed from the combined zinc and lead smelting and alloying business of Zinifex Ltd. and the zinc smelting and alloying business of Umicore NV.

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THE MINERAL INDUSTRY OF NORWAY

By Harold R. Newman

Norway's diverse geologic terrains offer a broad spectrum of mineral resources for exploration and development, including metals, industrial minerals, and mineral fuels. Norway's mineral resources include coal, iron ore, natural gas, nickel, petroleum, and titanium. The mining and quarrying industry, which was mostly of regional significance, was located mainly along the coast. The growth of the country's natural gas and petroleum sector in the past 10 years has contributed significantly to Norway's economy. Even though Norway was not a member of the European Union (EU), it participated in the EU's eurozone single market through the European Economic Area (EEA).

Minerals in the National Economy

Norway's economy is highly dependent upon the country's hydrocarbon resources; they were the country's single largest source of revenue. The petroleum sector provided about one-half of the country's exports and more than 30% of Government revenue. In anticipation of an eventual decrease in natural gas and petroleum production, the Government saves a significant amount of revenue from petroleum exports in a sovereign wealth fund (SWF), and its accumulated fund was the third largest of all the SWF holders after Luxembourg and Qatar (Dimireva, 2010).

Mineral Trade

Mineral trade was important to the national economy. In terms of the value of exports, petroleum was Norway's most important mineral commodity. Norway was ranked 31 in the world in terms of the value of its exports. U.S. exports to Norway were valued at $3,100 million and included other nonferrous metals, $271 million; oilfield and drilling equipment, $119 million; petroleum products, $59 million; iron and steel products, $26 million; and metallurgy-grade coal, $12 million. Norway's mineral-related exports to the United States were valued at $6,950 billion and included crude petroleum, $29,398 million; fuel oil, $1,959 million; petroleum products, $1,922 million; copper, $343 million; and stone, cement, and lime, $334 million (U.S. Census Bureau, 2010a, b).

Production

Norway produced aluminum, cadmium, cobalt, copper, ferroalloys, nickel, steel, and zinc metals and was a global supplier of aluminum, ferroalloys, and petroleum. Production of primary aluminum, cobalt, and petroleum decreased whereas production of ilmenite concentrate, olivine sand, and zinc metal increased. Aggregates, limestone, nepheline syenite, and sand and gravel were some of Norway's more economically important industrial mineral raw materials (table 1). The country's production of titanium accounted for about 6% of world production (Gambogi, 2011).

Structure of the Mineral Industry

The Norwegian mineral industry was composed of a mixture of Government and privately owned operations. Table 2 lists the major mineral companies that were operating in Norway in 2010 and their respective locations and capacities.

Commodity Review

Metals

Aluminum and Bauxite and Alumina.—Norsk Hydro ASA announced plans to build an aluminum recycling plant at Karmoy. The plant would have an initial capacity of 35,000 metric tons per year (t/yr); a capacity increase of 35,000 t/yr was planned after the first furnace is fully operational. The new plant would recycle dross and scrap from all of Norsk Hydro's aluminum plants in Norway, as well as from external sources in Iceland and Scandinavia. The first furnace was planned to be operational by midyear 2012 at an estimated cost of about $39.5 million (Solem, 2010).

Norsk Hydro announced a $4.9 billion purchase of Vale S.A. of Brazil's aluminum facilities in Brazil, thus securing bauxite reserves that would last Norsk Hydro for an estimated 100 years. This acquisition gave the company a leading bauxite mine and the world's leading alumina refinery among other mineral-related assets in Brazil. Norsk Hydro expected that the global demand for aluminum would increase by 76% between 2010 and 2020 and that gaining better access to bauxite and alumina would enable Norsk Hydro to respond to increased demand (Thomson Reuters, 2010).

Iron and Steel.—In 2010, the MV *Nordic Barents*, carrying 40,000 metric tons (t) of iron ore, took the northern most route from Norway to China on an Arctic Ocean shortcut through the melting ice cap. The *Nordic Barents* was the first non-Russian commercial vessel to attempt a nonstop crossing of a route that skirts the receding Arctic ice cap. This route reduced the trip by about 5,000 nautical miles and several days, saved the owners of the cargo thousands of dollars, and made history in the process. Russian law required icebreaker escort, even when ice danger was small, owing to the lack of onshore mechanical and medical support. Northern Iron Ltd. had sent 15 ships of iron ore to China since it began mining in 2009. All had steamed south, then east through the Suez Canal or around the Cape of Good Hope and had thereby risked the possibility of encountering pirates in the Indian Ocean (Gibbs, 2010).

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Industrial Minerals

Norway was a regionally significant producer of industrial minerals. It was among the world's leading producers of olivine sand and nepheline syenite. Production of aggregate, gravel, and sand were some of Norway's important raw materials. The European industrial minerals market was the primary market for Norway's mineral raw materials.

Feldspar.—SCR Sibelco Nordic A/S announced that it was closing its pegmatite mine near Lillesand owing to the decreased market demand for feldspar. Sibelco stated that the closure was because of expensive processing costs and the decreasing demand for feldspar in traditional cathode ray tube TV sets. This market had declined steadily since the development of liquid crystal display and plasma TV screens—developments that also affected consumption of other minerals, such as celestite (Industrial Minerals, 2010).

Mineral Fuels and Other Sources of Energy

Norway had a highly developed natural gas and petroleum sector. Natural gas production had been steadily increasing since 2005, and petroleum production had been declining since 2001 (table 1). Norway was the leading petroleum producer and exporter in Western Europe in 2010. Also, Norway was the world's second ranked exporter of natural gas after Russia and the world's fifth ranked natural gas producer in 2010 (U.S. Energy Information Administration, 2010a).

The Government signed a natural gas and petroleum agreement with six West African countries to help them gain jurisdiction over their natural gas and petroleum resources by helping establish the limits of each country's outer continental shelf (the area beyond 200 nautical miles). Under the agreement, the Government would provide assistance with the establishment of these continental shelves. The agreement was signed with Cape Verde, Gambia, Guinea, Guinea-Bissau, Mauritania, and Senegal. Establishing the limits of the continental shelf is important because it determines who can exploit the mineral resources in that area (Afriquejet.com, 2010).

Coal.—Store Norske Spitsbergen Kulkompani A/S (Store Norske) was Norway's sole coal producer and the most northerly operator in the world. Coal mining was the main industry on the Svalbard Arctic archipelago, which is located about midway between mainland Norway and the North Pole. Norway continued to be a net exporter of coal from two mines on Svalbard: Svea Nord, which is located south of Longyearbyen, and the Gruve 7 Mine. About 25,000 t of coal from the Gruve 7 Mine was used in the country's only coal-fired power station on Spitsbergen Island; the rest was exported to Europe. Store Norske announced that it was investing about $17 million in the Gruve 7 Mine. The investment would be used for new equipment, a new coal storage facility and new loading facilities (Barents Observer.com, 2011).

Store Norske announced that it had applied for permission to open a new mine in Lunckefjell. Development of the Lunckefjell Mine was scheduled to commence in the spring of 2012. The planned start of mining operations was scheduled for the winter of 2013. The Lunckefjell deposit consisted of high-calorific-value coal that was expected to be suitable for metallurgical purposes. Such coal had a higher market value than coal for energy production (Store Norske Spitsbergen Grubekompani A/S, 2010).

Natural Gas.—Norway had estimated proven reserves of 2 trillion cubic meters of natural gas as of January 2010. Norway's natural gas production had been increasing every year since 1994. The annual increases had been sustained by incorporating new fields in the Barents Sea and the Norwegian Sea. Norway's single largest natural gas field was the Troll-Oseberg field (U.S. Energy Information Administration, 2010a).

Dong Energy AS announced a development plan for the Marulk natural gas field. Marulk was to be developed to connect to the adjacent Norne field, which was in production. Two production wells would be connected to and controlled by the production vessel at the Norne field by way of a sea-bed installation. The natural gas would be transported from the production vessel to facilities on the west coast of Norway through the Gassled pipeline system either to the European continent or to the United Kingdom (Dong Energy AS, 2010).

Petroleum.—Norway, which had the largest petroleum reserves in Western Europe, was reported to have 5.67 billion barrels of estimated proven reserves as of January 2010. All the reserves are located offshore on the Norwegian Continental Shelf (NCS), which is divided into three sections: the Barents Sea, the North Sea, and the Norwegian Sea. The bulk of production had taken place in the North Sea, with smaller amounts extracted in the Barents Sea and the Norwegian Sea. (U.S. Energy Information Administration, 2010b).

The Government announced its 2010 licensing round for predefined areas (APA). The 2010 APA offered 63 more predefined areas than were offered in the 2009 round; 43 in the Norwegian Sea and 20 in the Barents Sea. The announcement was thought to represent a major extension of natural gas and petroleum operations in the Norwegian Arctic. The Government was planning to announce more projects in the APA on the NCS (Oil and Gas Journal, 2010).

StatoilHydro ASA announced that it was awarded 11 production licenses on the NCS. Most of the licenses lie near established infrastructure and could help to extend the life of the installations and open up further exploration opportunities in these areas (Rigzone.com, 2011).

Renewable Energy.—Norway had excellent wind power potential and the Government was continuing its efforts to develop offshore wind power generation. Typical sites at the coast have prevalent mean annual Arctic winds in the range of 8 meters per second (m/s) to 10 m/s. This was considerably better than the typical wind conditions in Denmark or northern Germany. Enova SF, a Government agency, announced plans to build the world's most powerful wind turbine. The $23 million, 162-m-tall prototype wind turbine would be built with the objective of developing a technology that would result in more efficient energy generation for offshore wind power. The prototype would first be tested on land in Oeygarden in southwestern Norway for 2 years and was expected to be able to supply power to 2,000 homes. Norway was one of the world's leading natural gas and petroleum producers; however,

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it obtained most of its own energy through hydroelectric power. The amount of hydropower it produced—120 terawatt hours per year—was the highest in Europe. About 0.4% of its electric grid was supplied by solar cells (Independent, The, 2010).

Outlook

Exploration drilling in frontier areas in the Barents Sea and the Norwegian Sea is set to continue. The Norwegian Petroleum Directorate plans to continue with efforts to open up new offshore areas, particularly in the Arctic region. Norway is also expected to continue to obtain nearly all its electricity from hydropower; however other renewable resources, such as wind power, are being investigated. Industrial minerals are expected to continue to be important to Norway's economy.

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TABLE I

NORWAY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[e]
METALS						
Aluminum:						
Primary	metric tons	1,422,000	1,304,400	1,368,000 r	1,090,000	800,000
Secondary	do.	349,200	350,000	350,000 e	350,000	300,000
Cadmium, smelter	do.	125	269	178	249 2	300
Cobalt, metal, refined	do.	4,927	3,939	3,719	3,510 2	3,208 2
Copper, metal, refined, primary and secondary	do.	39,700	34,212	32,000 e	33,900	32,000
Iron and steel:						
Iron ore and concentrate, Fe content		397 r	403 r	477 r	896 2	3,105 2
Metal:[e]						
Pig iron		100	100	100	100	100
Ferroalloys:						
Ferromanganese		130	130 r	130 r	130	130
Ferrosilicomanganese		326	294	273 r	250	249
Ferrosilicon, 75% basis		124	170 r	185 r	233 2	230
Silicon metal		150	146 r	155 r	150 2	175
Other		60	60	60	150	150
Total		790 r	800 r	803 r	913	934
Steel, crude		679	740	560	579 2	514 2
Semimanufactures, rolled		600	650	600	600	600
Mercury	metric tons	23	45	33	30	25
Nickel:						
Mine output:						
Concentrate[e]	do.	400	600	900	850	800
Ni content	do.	362	246	377 r	369 2	332 2
Metal, primary	do.	81,974	87,590	88,741	88,577	88,000
Titanium:[e]						
Ilmenite concentrate		850	882 2	915 2	671 2	864 2
TiO_2 content		385	390	403 r	289 2	371
Zinc, metal, primary	metric tons	160,670	157,027	145,469	137,622 2	147,775 2
INDUSTRIAL MINERALS						
Cement, hydraulic[e]		1,695	1,700	1,800	1,700	1,700
Clays		320	319	279	227 r,2	230
Feldspar		65	65	62	71 r,2	56 2
Graphite[e]	metric tons	9,000	1,400	4,100 r	4,562 2	6,270 2
Lime, hydrated, quicklime[e]		70 r	70 r	110 r	100	100
Mica, flake[e]	metric tons	2,700	1,000	1,000	--	--
Nepheline syenite[e]		312	312 2	346 2	270 r	327 2
Nitrogen, N content of ammonia[e]		350	350	350	300	300
Olivine sand		3,000 e	2,562 2	2,554 2	1,267 2	2,560 2
Sand and gravel		13,418	15,325	14,817	13,047 2	13,011 2
Stone, crushed:						
Dolomite		525 e	826	744	579 r,2	604 2
Limestone		7,200 e	8,770	6,781	6,151 2	6,129 2
Quartz and quartzite		834	1,067	1,025	1,022 r,2	1,055 2
Sulfur, byproduct:[e]						
Metallurgical		80	80	80	80	80
Petroleum		20	20	20	20	20
Total		100	100	100	100	100
Talc, soapstone, steatite	thousand metric tons	57	66	38	23 2	64 2
MINERAL FUELS AND RELATED MATERIALS						
Coal, all grades		2,359	3,223	3,429	2,437	1,685 2
Gas, natural, marketed[3]	million cubic meters	87,600	89,700	99,200	99,000	105,280 2
Peat, for agricultural use	do.	78	159	497	500	500

See footnotes at end of table.

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TABLE 1—Continued

NORWAY: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[e]
MINERAL FUELS AND RELATED MATERIALS—Continued						
Petroleum:						
Crude[4]	thousand 42-gallon barrels	965,000	923,940	901,550	854,830 [2]	777,450 [2]
Natural gas liquids[e]	do.	60,000	60,000	50,000	50,000	50,000
Refinery products:[e]						
Naphtha	do.	10,000	10,000	10,000	10,000	10,000
Gasoline	do.	28,000	28,000	28,000	28,000	28,000
Kerosene	do.	5,800	5,800	5,800	5,800	5,800
Distillate fuel oil	do.	50,000	50,000	50,000	50,000	50,000
Residual fuel oil	do.	12,000	12,000	12,000	12,000	12,000
Other products	do.	4,000	4,000	4,000	4,000	4,000
Refinery fuel and losses	do.	3,000	3,000	3,000	3,000	3,000
Total	do.	113,000	113,000	113,000	113,000	113,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 31, 2012.

[2]Reported figure.

[3]Reported as total methane sales.

[4]Excluding natural gas liquids.

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TABLE 2
NORWAY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Hydro Aluminium ANS (Norsk Hydro ASA, 70%)	Smelters at Ardal, Hoyanger, Husnes, Karmoy, and Sunndal	600
Do.		do.	Plant at Holmestrand	90
Do.		Alcoa Norway ANS (Alcoa Inc., 100%)	Smelters at Lista and Mosjoen; anode plant at Mosjoen	282
Do.		Sør-Norge Aluminium ASA (Norse Hydro A/S, 50%, and Rio Tinto Alcan, 50%)	Smelter at Husnes	165
Cadmium		Norzink A/S (Outokumpu Oyj, 100%)	Smelter at Eitrheimsneset	0.3
Cement		Norcem A/S	Plants at Brevik and Kjopsvik	2,150
Coal		Store Norske Spitsbergen Grubekompani A/S	Mines at Longyearbyen and Svea	450
Cobalt		Nikkelverk A/S (Xstrata plc, 100%)	Smelter at Kristiansand	5
Copper:				
Ore, Cu content		Nikkel og Olivin A/S (Outokumpu Oyj, 100%)	Mine at Narvik	1
Metal		Nikkelverk A/S (Xstrata plc, 100%)	Smelter at Kristiansand	40
Dolomite		Franzefoss Bruk A/S	Mine at Ballagen	350
Do.		Norwegian Holding A/S	Mines at Hammerfall, Logavlen, and Kvitblikk	500
Feldspar		SCR Sibelco Nordic A/S	Mine at Lillesand	100
Ferroalloys		Elkem Salten (Elkem A/S, 100%)	Ferrosilicon plant at Straumen	90
Do.		Elkem Bjolvefossen (Elkem A/S, 100%)	Ferrosilicon plant at Alvik	60
Do.		Elkem Thamshavn (Elkem A/S, 100%)	Ferrosilicon plant at Orkanger	60
Do.		Finnfjord Smelteverk A/S, Rana Metal (FESIL ASA, 100%)	Ferrosilicon plant at Mo i Rana	110
Do.		A/S Hafslung Metal (FESIL ASA,100%)	Ferrosilicon plant at Sarpsborg	75
Do.		Ila og Lilleby Smelteverk (FESIL ASA, 100%)	Ferrosilicon plant at Finnsnes	20
Do.		Oye Smelteverk (Tinfos Jernverk A/S, 100%)	Silicomanganese plant at Kvinesdal	235
Iron, metal		Ulstein Jernstoperi A/S	Hordvikneset	10
Iron ore		Rana Gruber A/S (Norsk Jernverk Holding A/S, 100%)	Mine at Mo i Rana	2,000
Do.		Northern Iron Ltd.	Sydvaranger Mine, northern Norway	3,000
Do.		Arctic Bulk Minerals A/S	Mine and plant at Kirkenes	1,500
Lime		Hylla Kalkverk (Nikolai Bruch A/S, 100%)	Verdal/Trondheim Mine and plant	80
Do.		A/S Norsk Jernverk	Plant at Mo i Rana	48
Do.		Ardal og Sunndal Verk A/S	More og Romsdal Mine at Surnadal	20
Do.		Breivik Kalkverk A/S	Alesund Mine at Larsnes	20
Do.		Mjoendalen Kalkfabrik	Plant at Asen/Drammen	7
Limestone		Norcem A/S	Dalen, Bjorntvedt, and Kjopsvik Mines	1,600
Do.		Vardelskalk A/S (Franzefoss Burk A/S, 100%)	Sandvika Mine	800
Do.		Breivik Kalkverk A/S	Visnes and Glaerum Mines	500
Magnesium		Norsk Hydro ASA (Government, 51%)	Plants at Porsgrunn and Sauda	50
Manganese, alloys		Eramet SA	do.	500
Natural gas	million cubic meters	StatoilHydro ASA	Gama, Gullfaks, Sleipner Ost, and Statfjord fields	12,270
Do.	do.	Phillips Petroleum Company Norway	Ekofisk field	9,900
Do.	do.	Elf Petroleum Norge A/S	Frigg, Heimdal, and Ost-Frigg fields	5,750
Do.	do.	Norsk Hydro Produksjon A/S	Troll-Oseberg field	2,600
Do.	do.	StatoilHydro ASA	Mikkel field	2,100
Do.	do.	Total S.A, 40%; Petoro S.A., 30%; Marathon Petroleum Norge AS, 20%; Norsk Hydro Produksjon A/S, 10%	Skirne field	1,550
Do.	do.	BP Petroleum Development of Norway	Gyda and Ula fields	1,040
Do.	do.	Esso Norge A/S	Odin field	1,000
Do.	do.	Amoco Norway A/S	Hod and Valhall fields	910
Nepheline syenite		North Cape Mineral A/S (Unimin Corp., 84%)	Mine at Stjernoy	350
Nickel:				
Ore, Ni content		Nikkel og Olivin A/S (Outokumpu Oyj, 100%)	Mine at Narvik	3
Do.		Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	0.5
Metal		Nikkelverk A/S (Xstrata plc, 100%)	Smelter at Kristiansand	85
Olivine		North Cape Minerals A/S (Sibelco Group, 89%, and Franzefoss A/S, 11%)	Aheim Mine and plant	2,500
Do.		do.	Stranda Mine and plant	300
Do.		Franzefoss Bruk A/S	Lefdal Mine at Bryggja	500

See footnotes at end of table.

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TABLE 2—Continued
NORWAY: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum	42-gallon barrels per day	StatoilHydro ASA (Government, 100%)	Gullfaks, Norne, Statfjord, Tommeliten, Urd, and Veslefrikk fields	1,069,300
Do.	do.	Norsk Hydro Produksjon A/S	Brage, Mime, and Oseberg fields	566,200
Do.	do.	Phillips Petroleum Company Norway	Ekofisk field	237,500
Do.	do.	Saga Petroleum A/S	Snorre field	170,000
Do.	do.	BP Petroleum Development of Norway	Gyda and Ula fields	155,000
Do.	do.	A/S Norske Shell	Draugenfield	90,000
Do.	do.	ExxonMobil Refining & Supply Co.	Slagen refinery	110,000
Do.	do.	Statoil Mongstad A/S	Mongstad refinery	200,000
Pyrite		Folldal Verk A/S (Norsulfid A/S, 100%)	Mine at Hjerkinn	10
Quartzite		Elkem Tana (Elkem A/S, 100%)	Mine at Tana	540
Do.		Elkem Marnes (Elkem A/S, 100%)	Mine at Sandhornoy	200
Do.		Vatnet Kvarts A/S	Mine at Nordland	150
Do.		Snekkevik Kvartsbrudd	Mine at Kragero	110
Silicon metal		Lilleby Metall A/S (FESIL ASA, 100%)	Plant at Trondheim	9
Do.		FESIL ASA	Plant at Holla	50
Steel		Fundia AB (Norsk Jenverk, 50%, and Rautaruukki Group, 50%)	Plants at Christiania, Mandal Stal, Mo i Rana, and Spigerverk	600
Talc		A/S Norwegian Talc (Pluess-Staufer AG, 51%)	Mine and plant at Altermark/Knarrevik and Framfjord	90
Do.		Kvam Minerals A/S	Mine and plant at Kvam	6
Titanium, concentrate		Titania A/S (Kronos Norge A/S, 100%)	Mine at Tellnes	915
Zinc, metal		Norzik A/S (Outokumpu Oyj, 100%)	Smelter at Odda	150

Do., do. Ditto.

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THE MINERAL INDUSTRY OF POLAND

By Mark Brininstool

Poland had significant mineral reserves of several mineral commodities and also had important mineral processing facilities. In 2010, Poland was estimated to be the world's 4th ranked producer of rhenium, the 9th ranked producer of silver, and the 10th ranked producer of mined copper. Industrial minerals, such as aggregates, cement, feldspar, gypsum, lime, salt, and sulfur, were also produced in significant quantities. For mineral fuels, Poland was ranked as one of the world's top 10 producers of bituminous coal (based on 2008 production data) but was dependent on imports of oil and gas to meet domestic demand. Although Poland produced a relatively wide range of mineral commodities, bituminous coal, cement, and copper accounted for an estimated 66% of the value of mineral production (Galos, Ney, and Smakowski, 2010, p. 11; World Energy Council, 2010, p. 3; Apodaca, 2011; Brooks, 2011; Crangle, 2011; Edelstein, 2011; Kostick, 2011; Miller, 2011; Polyak, 2011; Tanner, 2011).

Minerals in the National Economy

In 2010, Poland's real gross domestic product (GDP) increased by 3.8% compared with the GDP in 2009. Mining and quarrying accounted for about 2.3% of the total GDP. In 2009 (the latest year for which data were available), the total value of mineral commodity production was estimated to be $16.8 billion,[1] which was a 23% decrease compared with that of 2008 but only a 0.2% decrease using reported zloty values of 52.4 billion zlotys in 2009 and 52.5 billion zlotys in 2008. The mineral industry in Poland maintained its value in 2009, but the Polish zloty depreciated significantly in 2009, so examining the value of mineral commodity production in terms of foreign currencies could create the impression that there was a significant decrease in the value of production. Mineral fuels accounted for 54% of the total value of mineral commodity production (bituminous coal production accounted for 76% of the value of mineral fuels production); metals, 23% (copper production accounted for 72% of the value of metals production); and industrial minerals, 23% (cement production accounted for 37% of the value of industrial minerals production). The three most important individual minerals in terms of value in 2009 were bituminous coal, copper, and cement, which made up about 41%, 17%, and 9% respectively, of the value of Poland's mineral commodity production (Ney and Smakowski, 2009, p. xi; Galos, Ney, and Smakowski, 2010, p. 11, 13; Central Statistical Office of Poland, 2011c; Dmochowska, 2011a, p. 475).

Government Policies and Programs

Mining activities are regulated by the Polish Geological and Mining Law of February 4, 1994. The trade, distribution, and storage of gaseous fuels are regulated by the Act on Reserves of Crude Oil, Petroleum Products and Natural Gas dated February 16, 2007, and the Polish Energy Law of April 10, 1997. Probably the most important Government program with regard to the mineral industry was the Privatisation Programme for the Years 2008–2011. The privatization program included important mining and energy companies, which are discussed in the Structure of the Mineral Industry section below (Polskie Gornictwo Naftowe i Gazownictwo S.A., 2009, p. 41–43).

Production

Production of ferrosilicon increased by 450%; native sulfur produced using the Frasch method, by 97%; rhenium content of ammonium perrhenate (APR), by 94%; manufactured gas, by 35%; pig iron, by 18%; peat, by 13%; steel and refined lead, by 12% each; and cement clinker, by 10%. Production of fire clay decreased by 29%; zinc content of concentrate, by 26%; zinc content of ores, by 24%; lead content of ores, by an estimated 21%; and cadmium, by 16%. KGHM Ecoren S.A. began production of rhenium metal in the form of pellets in 2010.

Structure of the Mineral Industry

The vast majority of companies in the mineral industry in Poland were privately owned. The Polish Government (through ownership of shares by the Polish Ministry of Treasury) also owned shares in a small number of significant producers of mineral products but was attempting to privatize many of these holdings. One of the Government's holdings was a 31.79% stake in Poland's sole copper producer, KGHM Polska Miedz S.A. (KGHM). In 2009, the Government owned a 41.79% share of KGHM, but in January 2010, the Government sold 20 million shares in the company to bring Government ownership down to 31.79%. No other shareholders owned more than 5% of the company's shares. The Government also had planned to sell 85% of its 100% holding in Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A., which was Poland's only producer of lead and zinc ore and the leading producer of refined zinc, but it does not appear as though this sale was accomplished by the end of 2010 (Ministry of Treasury of the Republic of Poland, 2009, p. 13; KGHM Polska Miedz S.A., 2011, p. 141).

In the mineral fuels sector, the Polish Government owned significant shares of Poland's coal producers and oil and gas producers Grupa LOTOS S.A. and Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG). In 2010, the Government reduced its shareholding in bituminous coal producer Lubelski Wegiel Bogdanka S.A., to 13.84% from 60.53%; in the next few years, it planned to privatize bituminous coal producers Jastrzebska Spolka Weglowa S.A. and Katowicki Holding Weglowy S.A. and brown coal and lignite mining companies KWB Adamow S.A.

[1]Where necessary, values have been converted from Polish zlotys (PLN) to U.S. dollars (US$) at an annual average exchange rate of PLN2.41=US$1.00 for 2008, PLN3.12=US$1.00 for 2009, and PLN3.02=US$1.00 for 2010.

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and KWB Konin S.A. In 2010, the Government reduced its share of Grupa LOTOS, which owned oil and gas and refined petroleum production facilities, to 50.97% from 63.97% (Galos, 2009, p. 22; Lubelski Wegiel Bogdanka S.A., 2010, p. 107; 2011, p. 79; Grupa LOTOS S.A., 2011, p. 12).

Table 2 is a list of the major mineral industry facilities in Poland. For this year's report, four significant mineral commodity production facilities were removed from the table. Aluminium Konin-Impexmetal S.A. halted production of its primary aluminum smelter in 2009 so was removed from the list of primary aluminum producers; the Konin plant continued to produce rolled products from secondary aluminum and purchased aluminum. The petroleum refinery LOTOS Jaslo S.A. (called Podkarpackie Zaklady Rafyneryjne in previous editions of the Minerals Yearbook) was removed from the list of refined petroleum producers because it discontinued oil processing in the third quarter of 2008 and made storage and trade of refined petroleum products its core business. ArcelorMittal Poland S.A.'s steelworks in Swietochlowice and Huta Zabrze S.A. were removed from the list of crude steel producers in table 2 because it is now believed that these two plants produced only steel products and not crude steel. It is not known when crude steel production was halted (Grupa LOTOS S.A., 2009, p. 65; Galos, Ney, and Smakowski, 2010, p. 49; ArcelorMittal Poland S.A., 2011).

Mineral Trade

Poland is dependent on imports of most mineral commodities for domestic consumption. In 2009, the value of the country's mineral commodity imports was $17.0 million, and the value of its mineral commodity exports was $4.9 million. Mineral fuels accounted for about 83% ($14.1 million) of the value of mineral commodity imports, and metals accounted for about 75% ($3.7 million) of the value of mineral commodity exports. In 2009, the total value of all Poland's imports was $150 billion, and the total value of all its exports was $160 billion (Galos, Ney, and Smakowski, 2010, p. 20; Dmochowska 2011b, p. 39).

Complete trade data for mineral commodities were not available for 2010, and the trade data that were available from the Central Statistical Office of Poland were slightly inconsistent with the values in the previous paragraph (which were converted from Polish zlotys), but trade data for some important commodities were available. In 2010, crude petroleum imports were valued at about $12.3 billion (a 46% increase), and copper and copper alloys exports were valued at about $2.4 billion (a 30% increase). In previous years, crude petroleum was the leading import commodity in terms of value, and refined copper was the leading export commodity (Central Statistical Office of Poland, 2010b, 2011b).

Commodity Review

Metals

Copper.—KGHM was the only copper mining and primary copper metal producing firm in Poland. It operated two copper smelters and three mines (the Lubin, the Polkowice-Sieroszowice, and the Rudna Mines) and had reported reserves of about 1.4 billion metric tons (Gt) of ore containing about 25 million metric tons (Mt) of copper. KGHM was a significant world producer of copper and silver, representing about 3% of world output of copper mine and refined copper production and about 5% of world mine production of silver (Galos, Ney, and Smakowski, 2010, p. 161; KGHM Polska Miedz S.A., 2011, p. 108, 112).

KGHM's development strategy for 2009–18 addressed the company's main challenges of lowering production costs and increasing the company's resource base. By 2010, the cost of production of refined copper at KGHM had increased by 111% in Polish zlotys compared with the cost of production in 2000. To reduce production costs, KGHM planned to make investments in infrastructure and technology, although no specific projects were listed. The company also planned to expand its resource base and increase the production of copper in concentrate to about 700,000 metric tons per year (t/yr) compared with 425,000 metric tons (t) of copper in concentrate in 2010 by investing in further exploration and mining within Poland and internationally, acquiring other mining companies, and increasing scrap copper processing (KGHM Polska Miedz S.A., 2011, p. 106, 136–137).

Iron and Steel.—Poland had not produced iron ore since 1990 and was dependent on imported iron ore and concentrates for domestic pig iron production. In 2010, Poland imported about 6.5 Mt of iron ores and concentrates, which was a 71% increase in imports compared with those of 2009 (3.8 Mt), when production of pig iron was exceptionally low owing to lower demand for steel as a result of the world economic crisis. About 82% of these imports came from Ukraine and about 16% came from Russia. All the imported iron ore and concentrates was used for pig iron production at ArcelorMittal Poland S.A.'s iron and steel plants at Dabrowa Gornicza and Krakow (Central Statistical Office of Poland, 2010b, 2011b; Galos, Ney, and Smakowski, 2010, p. 271–273).

Crude steel production increased by 12% as economic conditions within Poland and in the rest of Europe improved and led to higher levels of steel consumption in 2010 compared with those of 2009. In the past 5 years, crude steel production followed general economic trends; production peaked in 2007 (10.6 Mt), decreased in 2008 (9.7 Mt) as the world economic crisis began, reached the lowest level of production in 2009 (7.1 Mt) during the worst year of the economic crisis, and showed signs of recovery in 2010. According to the Polish Steel Association, Poland's apparent consumption of finished steel products in 2010 was 9.82 Mt, which was about a 20% increase compared with that of 2009, and Poland's exports of steel products increased by 5% to 4.2 Mt. Employment in the steel industry decreased by 3.1% compared with that of 2009 to 25,475 persons (table 1; Polish Steel Association, 2010, p. 24–26).

Lead and Zinc.—Zaklady Gorniczo "Trzebionka" S.A. was removed from the list of lead and zinc mining companies in table 2 because the company stopped production of lead and zinc ore in early 2009 because of the exhaustion of reserves. The shutdown of Zaklady Gorniczo "Trzebionka" S.A. was the main reason for the significant decrease in production of lead and zinc mine output in 2010. Mining of lead and zinc ore at the

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ZGH "Boleslaw" Mine at Olkusz and Pomorzany was expected to end in 2013, although mining activities could continue for an additional 20 years if new reserves are successfully developed. ZGH "Boleslaw" S.A. was in talks to take over Huta Cynku Miasteczko Slaskie S.A. (HCM) (a producer of lead and zinc metal) and planned to take over the company at the end of 2009, but it could not be confirmed whether this transaction took place (Galos, 2009, p. 25; Metal Bulletin, 2009, p. 10; Galos, Ney, and Smakowski, 2010, p. 293–294, 526).

Rhenium.—KGHM Ecoren S.A. was the only European producer of ammonium perrhenate (APR) and metallic rhenium from its own sources. In 2010, KGHM Ecoren was responsible for about 9% of total world production of rhenium contained in APR. On April 27, KGHM Ecoren began production of marketable quantities of metallic pellets containing 99.95% rhenium, which is an important additive in superalloys used in the production of jet engines and catalysts. The plant could produce up to 3.5 t/yr of rhenium pellets. In Poland, rhenium was extracted from sulfuric acid waste from copper processing; copper deposits controlled by KGHM contained on average 0.6 parts per million rhenium (Galos, Ney, and Smakowski, 2010, p. 403; KGHM Ecoren S.A., 2010).

Mineral Fuels

Coal.—As of the end of 2009, Poland had bituminous coal reserves of about 16.6 Gt and proved reserves of about 4.4 Gt and was the leading producer of bituminous coal in the European Union (EU). Reserves were not expected to be expanded owing to environmental concerns, difficult geologic conditions, and the low quality of the coal. Poland was among the world's 10 leading producers of brown coal and lignite, and as of the end of 2009, reserves were about 14.9 Gt and proved reserves were about 1.4 Gt. Coal was Poland's major mineral fuel, and in 2010, coal and lignite accounted for 87% of electricity production. In 2009 (the latest year for which data were available), bituminous coal and lignite made up 66% and 19%, respectively, of Poland's energy balance (Central Statistical Office of Poland, 2010a, p. 27, 58–59; 2011a, p. 48; Galos, Ney, and Smakowski, 2010, p. 253, 303; European Association for Coal and Lignite, 2011).

Given its lack of significant petroleum and natural gas resources, the Government of Poland considered coal to be one of the most important components of the country's energy security and sought to promote "the efficient and effective management of coal deposits" (Ministry of Economy of the Republic of Poland, 2009a, p. 9–10). The Energy Policy of Poland Until 2030 (released in 2009) emphasized the importance of coal and predicted that it would remain the most important domestically produced mineral fuel for the foreseeable future. The report forecast that, in 2010, electricity generated from bituminous coal and lignite would make up 53% and 35%, respectively, of total electricity generation, and that by 2030, electricity from these sources would make up 36% and 21%, respectively, of total electricity generation. The report also estimated that bituminous coal and lignite would make up 31% and 8%, respectively, of Poland's primary energy demand in 2030. To ensure that the coal and lignite resources of Poland would be used efficiently, the Government planned to increase geologic research in coal and lignite, abolish legal barriers to the development of coal and lignite deposits, include coal deposits in land development plans to ensure that access to coal and lignite deposits would not be blocked, and adopt other measures to encourage future coal and lignite production (Ministry of Economy of the Republic of Poland, 2009a, p. 9–10; 2009b, p. 15–16).

The use of coal as a cheap source of fuel to generate significant amounts of electricity in Poland through 2030 could be inhibited by EU regulations that require reductions in carbon dioxide emissions. Reducing the use of coal as a cheap source of energy would be difficult economically, and the Polish Government was considering ways to limit reductions to coal-based electricity production. In April, the European Commission (EC) approved Poland's national allocation plan for distributing carbon dioxide emission allowances for 2008–12. In 2007, the EC rejected the original plan submitted by the Polish Government because it proposed that 285 Mt of emission allowances be distributed. The new plan that was approved allocated 208.5 Mt of allowances (EUobserver.com, 2010).

Natural Gas and Petroleum.—In 2010, Poland produced about 5.7 billion cubic meters of natural gas and 5.1 million barrels (Mbbl) of crude oil but was dependent on imports for the majority of its supplies. About 1.4 Mbbl of crude petroleum and about 20.7 million cubic meters of gas were produced by LOTOS Petrobaltic S.A. in the Baltic Sea Shelf; the remaining oil and gas were produced on the Polish mainland. In 2010, Poland imported about 160.8 Mbbl of crude oil (an 11% decrease compared with the 154.5 Mbbl imported in 2009), of which 94% was from Russia. Trade statistics for total natural gas imports were not available, but PGNiG imported about 10.07 billion cubic meters of natural gas (a 10% increase compared with that of 2009), of which 89.7% came from Russia and 10.3% came from Germany. In 2009 (the latest year for which data were available), PGNiG accounted for about 97% of all natural gas imports into Poland (Galos, Ney, and Smakowski, 2010, p. 214; Central Statistical Office of Poland, 2011b; Grupa LOTOS S.A., 2011, p. 5; Polskie Gornictwo Naftowe i Gazownictwo S.A., 2011, p. 41).

PGNiG was Poland's leading producer of oil and gas, accounting for about 73% of crude petroleum production (3.7 Mbbl) and 75% of natural gas production (4.24 billion cubic meters). The company also conducted exploration work in Denmark, Egypt, Libya, Norway, Pakistan, and Poland, and expected to begin production of oil and gas at the Skarv/Snadd/Idun field on the Norwegian Continental Shelf in the second half of 2011. The company planned to produce 100 million cubic meters of natural gas and about 670,000 barrels of crude oil from the Skarv/Snadd/Idun field in 2011 and then to increase production to 400 million cubic meters of natural gas and about 3 Mbbl of crude oil in 2012. The company planned to transport natural gas to mainland Europe and to sell crude oil straight "from the wellhead" (Polskie Gornictwo Naftowe i Gazownictwo S.A., 2011, p. 36). Domestically, PGNiG planned to begin production at the Lubiatow-Miedzychod-Grotow (LMG) field near Gorzow Wielkopolski in 2013 and expected that production at the

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LMG field would double PGNiG's domestic crude petroleum output. PGNiG also planned to increase domestic natural gas production to about 4.5 billion cubic meters per year (Polskie Gornictwo Naftowe i Gazownictwo S.A., 2011, p. 30, 34–36).

In 2010, there was a large amount of interest throughout the world in unconventional natural gas deposits because of relatively recent advancements in horizontal drilling and hydraulic fracturing that made it possible to extract previously uneconomic resources economically. Poland was frequently mentioned as a potential future shale gas producer because of estimations of its significant shale gas reserves and its desire to reduce its reliance on Russian natural gas imports. A world assessment of shale gas resources commissioned by the U.S. Energy Information Administration (EIA) and conducted by Advanced Resources International, Inc. identified three basins (Baltic, Lublin, and Podlasie) in Poland as prospective shale gas plays and estimated that they contained 792 trillion cubic feet (22 trillion cubic meters) of shale gas in-place, which included 187 trillion cubic feet (5 trillion cubic meters) of technically recoverable gas. Technically recoverable gas refers to the estimate of the amount of gas in-place that could actually be recovered using current production technology but does not take into account economic factors that could affect production. Poland accounted for about 31% of Europe's total shale gas in-place and 30% of total technically recoverable shale gas. The assessment's estimated amount of technically recoverable shale gas in Poland is equivalent to about 290 years of domestic consumption at current consumption rates, and indicated that, over the long run, shale gas could have a major effect on Poland's energy security (Galos, Ney, and Smakowski, 2010, p. 215; U.S. Energy Information Administration, 2011, p. 1.5, 7, V–1).

Although Poland may have considerable shale gas production potential, it is important to recognize that there are a number of challenges that would need to be overcome if a significant amount of shale gas was to be recovered in Poland. The major challenges for the shale gas industry include economic considerations and environmental concerns. The advanced drilling techniques and the low rates of shale gas recovery seen in operating shale gas projects in other countries make shale gas an expensive alternative to conventional natural gas resources. Environmental opposition to shale gas production has also been quite strong in other parts of the world, including the United States and the EU, and in the future, the Polish shale gas industry could be faced with opposition to its operations. On the other hand, in Poland, the desire to reduce dependence on natural gas imports from Russia and current popular support for shale gas production could produce an environment that is advantageous for shale gas production. It is hard to predict the future of shale gas in Poland, and any accurate estimation of future production would depend on a number of factors and would not be possible until more exploration and test drilling is done.

PGNiG reported that the Ministry of the Environment had awarded more than 70 exploration licenses for shale gas and tight gas deposits to more than 40 entities in recent years. Some of the most significant companies that were conducting exploration activities were Lane Energy Poland Sp. z o.o. (a subsidiary of 3 Legs Resources plc.) in partnership with BNK Petroleum Inc., Chevron Corp., ConocoPhillips Co., Exxon Mobil Corp., and Marathon Oil Corp. of the United States; Aurelian Oil and Gas plc. of the United Kingdom; San Leon Energy plc. of Ireland; Eni S.p.A. of Italy; and PGNiG (Polskie Gornictwo Naftowe i Gazownictwo S.A., 2011, p. 33).

Outlook

Continuing economic recovery from the economic crisis and an accompanying increase in domestic demand could lead to increased mineral commodity production, but much of the growth in demand for mineral products could depend on demand by Poland's trade partners, especially those in the EU. Most likely coal and copper will remain the leading mineral products in terms of production value, and dependence on imports of mineral fuels will remain one of Poland's biggest challenges. Also, Government ownership of important mineral producing companies will decline as privatization efforts continue.

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TABLE 1

POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Aluminum, metal:						
Primary	metric tons	57,620	54,468	47,543	-- [r]	--
Secondary[e, 3]	do.	18,900	21,500	18,000	16,900	18,000
Total[e]	do.	76,500	76,000	65,500	16,900	18,000
Cadmium, metal, primary	do.	373	421	603	534	451
Copper:						
Ore:						
Gross weight		31,279	30,262	29,416	29,700	29,300
Cu content	metric tons	559,894	505,900	482,400	498,960	480,600
Concentrate:						
Gross weight		1,946	1,876	1,866	1,929	1,841
Cu content	metric tons	497,000	452,000	429,400	439,000	425,400
Metal:						
Smelter:[4]						
Primary	do.	445,100	438,100	438,600	408,200	425,000
Secondary	do.	80,000	39,800	43,800	68,800	59,600
Total	do.	525,100	477,900	482,400	477,000	484,600
Refined, electrolytically, primary and secondary	do.	556,625	532,975	526,808	502,491	547,100
Gold:						
Mine output, Au content of Cu concentrate[e]	kilograms	500	500 [r]	500 [r]	500 [r]	500
Metal	do.	1,700	883	902	814	776
Iron and steel:						
Pig iron:						
For foundry use		21	--	--	--	-- [e]
For steel production		5,311	5,804	4,934	3,095 [r]	3,638
Total		5,332	5,804	4,934	3,095 [r]	3,638
Ferroalloys:						
Blast furnace, ferromanganese	metric tons	4,100	2,100	8,500	1,700 [r]	1,700 [e]
Electric furnace:						
Ferrochromium	do.	400	--	--	--	--
Silicomanganese	do.	3,310	15,600	25,100	-- [r]	--
Ferrosilicon	do.	13,034	58,538	56,031	9,673 [r]	53,206
Other	do.	4,500	6,200	2,900	4,200 [r]	4,000 [e]
Total ferroalloys	do.	25,344	82,438	92,531	15,573 [r]	59,000 [e]
Steel, crude:						
From oxygen converters		5,766	6,188	5,225	3,235 [r]	3,995
From electric arc furnaces		4,225	4,433	4,502	3,893	4,001
Total		9,991	10,621	9,727	7,128 [r]	7,996
Finished steel products:						
Hot rolled		7,666	8,011	7,610	6,232	6,658
Cold rolled		1,600	1,482	689	558	835
Pipe		417	401	409	347	384
Lead:						
Mine output:						
Pb content of Pb-Zn ore	metric tons	67,100	63,700	66,400	51,500 [r]	35,800
Pb content of Cu ore	do.	30,500	15,700	21,300	28,900 [r]	28,000 [e]
Total	do.	97,600	79,400	87,700	80,400 [r]	63,800 [e]
Concentrate, Pb content	do.	50,000	47,200	47,900	36,900 [r]	35,000 [e]
Metal, refined, primary and secondary:						
Primary[e]	do.	26,200	37,200	38,000 [r]	30,000 [r]	35,000
Secondary[e]	do.	56,600	67,000	70,200 [r]	70,400 [r]	77,000
Total[5]	do.	82,800	104,200	108,200 [r]	100,400 [r]	112,000 [e]
Platinum-group metals, average content of slimes:[e, 6]						
Palladium	kilograms	10	15	15	15	15
Platinum	do.	20	25	25	25	25

See footnotes at end of table.

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TABLE 1—Continued

POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS—Continued						
Rhenium:						
Ammonium perrhenate						
Gross weight	kilograms	1,500	3,500	4,900	3,500	6,709
Re content of ammonium perrhenate	do.	1,000	2,400	3,400	2,400	4,656
Rhenium metal in pellet form	do.	--	--	--	--	620
Selenium	metric tons	87	85	82	73 r	70 e
Silver:						
Mine output, Ag content of Cu concentrate	do.	1,266	1,199	1,161	1,207 r	1,181
Metal	do.	1,270	1,244	1,221	1,221 r	1,180 e
Zinc:						
Zn content:						
Mine output	do.	144,800	136,100	136,300	116,000 r	88,000
Concentrate output	do.	126,600	129,600	132,400	115,500 r	85,000 e
Metal, refined, including secondary	do.	133,900	141,800	142,600	139,100 r	149,000
INDUSTRIAL MINERALS						
Barite, beneficiated	metric tons	2,143	--	324	--	--
Cement:						
Clinker		11,220	13,168	12,443	10,659	11,768
Hydraulic		14,688	17,120	17,207	15,422 r	15,812
Clays and clay products:						
Bentonite:						
Crude	metric tons	--	1,300	3,000	3,000	3,000 e
Processed, including imported material	do.	93,880	105,943	90,412 r	81,354	85,981
Fire clay, crude		187	198	181	115	82
Kaolin:						
Crude		297	319	318	261 r	260 e
Beneficiated		144	153	166	143 r	140 e
Diatomite	metric tons	600	600	1,000	700 r	700 e
Feldspar:						
Run of mine	do.	431,300	497,900	599,100	445,500 r	445,000 e
Processed, including imported material	do.	457,600	501,800	643,700 r	478,000 r	478,000 e
Gypsum and anhydrite:						
Natural:						
Gypsum rock		1,172	1,298	1,283	1,119 r	1,150 e
Anhydrite		181	194	198	158 r	150 e
Total		1,353	1,492	1,481	1,277 r	1,300 e
Synthetic gypsum		1,230	1,338	1,596 r	2,076 r	2,000 e
Grand total		2,583	2,830	3,077 r	3,353 r	3,300 e
Lime, hydrated and quicklime		1,936	2,143	1,952	1,704 r	1,799
Magnesite:						
Concentrate	metric tons	62,500	65,000	60,000	47,000	50,000 e
Calcined	do.	--	--	-- r	-- r	--
Nitrogen, N content of ammonia		2,007	1,995	1,995	1,697	1,700 e
Quartz, quartzite, and quartz schist:						
Quartz and quartz crystal, marketable	metric tons	13,900	7,000	6,500	5,100	5,000 e
Quartzite, refractory, marketable	do.	16,900	46,100	72,500	25,700	34,200
Quartz schist, marketable	do.	10,800	9,500	7,100	3,500 r	3,500 e
Salt:						
Rock		1,130	591	618	999 r	1,236
Other (brine and desalination of mine waste water)		2,899	2,931	2,783	2,533 r	2,464
Total		4,029	3,522	3,401	3,532 r	3,700
Sand and gravel:						
Aggregates (construction sand and gravel), natural, mine output		116,561	139,388	149,312	140,890 r	140,000 e
Filling sand	thousand cubic meters	6,197	6,595	6,401	5,928 r	6,000 e
Foundry sand		762	782	1,244	1,701 r	1,817
Lime-sand brick production sand	thousand cubic meters	685	905	834	560 r	560 e
Silica sand (glass sand), marketable		1,525	2,268	2,398	2,127 r	2,458

See footnotes at end of table.

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TABLE 1—Continued

POLAND: PRODUCTION OF MINERAL COMMODITIES[1]

(Thousand metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Stone, mine output:						
Dimension stone		3,729	2,661	3,126	3,576 r	3,600 e
Dolomite		2,013	2,232	2,206	1,834	1,821
Limestone:						
For lime production		13,645	15,581	16,110	14,881 r	15,000 e
For non-lime end use		26,314	30,983	30,778	28,883 r	30,000 e
Road stone		160	141	300 r	260 r	260 e
Sulfur:						
Native, Frasch		800	834	762	263	517
Byproduct:						
From natural gas		20	23	21	25 r	25 e
From oil refineries and coking plants		182	188	201	190 r	200 e
From metallurgy		307	304	294	257 r	260 e
Other		2	1 r	1 r	1 r	1 e
Total		511	516 r	517 r	473 r	470 e
Grand total		1,311	1,350 r	1,279 r	736 r	990 e
MINERAL FUELS AND RELATED MATERIALS						
Carbon black	metric tons	34,100	41,100	36,300	27,800 r	28,000
Coal:						
Bituminous		95,220	88,313	84,345	78,064	76,728
Brown coal and lignite		60,844	57,538	59,668	57,108	56,510
Total		156,064	145,851	144,013	135,172	133,238
Coke		9,735	10,383	9,761	7,091	9,738
Gas:						
Natural	million cubic meters	5,650	5,653	5,382	5,537	5,671
Manufactured:						
Town gas	do.	10	10	4	4	4
Coke oven gas	do.	4,101	4,409	4,207	3,076 r	4,158
Total	do.	4,111	4,419	4,211	3,080 r	4,162
Peat, fuel and agricultural		577	641	632	594 r	672
Petroleum:						
Crude[7]	thousand 42-gallon barrels	5,900	5,350	5,600	5,100	5,100
Refinery products[e, 8]	do.	137,000	134,000	144,000	150,000	158,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through November 18, 2011.

[2]In addition to the commodities listed, cobalt and nickel, which are associated with copper ores, are produced in quantities that so far have not warranted further recovery.

[3]Based on official Polish estimates.

[4]Copper smelter production is based on production at KGHM Polska Miedz S.A. Additional smelter production may have taken place at the Institute of Non-Ferrous Metals at Gliwice but this production was not marketable and was produced only for research purposes.

[5]Reported figure.

[6]Estimates based on reported platinum- and palladium-bearing final (residual) slimes and their average Pt and Pd content from electrolytic copper refining.

[7]Figures were converted to barrels from production in metric tons, which was reported as the following: 2006—795,742; 2007—720,603; 2008—754,907; 2009—686,992; and 2010—686,487.

[8]Figures were converted to barrels from production in metric tons, which was reported as the following: 2006—18,689,470; 2007—18,187,650; 2008—19,631,450; 2009—20,499,407; and 2010—21,513,663.

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TABLE 2
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Aluminum, secondary	Aluminium Konin-Impexmetal S.A.	Konin	NA.
Do.	NPA Skawina Sp. z o.o	Skawina	NA.
Do.	Grupa KETY S.A.	Kety	NA.
Do.	Nicromet	Bestwinka	NA.
Do.	Alumetal S.A.	Kety	NA.
Do.	POLST Sp. z o.o.	Walbrzych	NA.
Barite[2]	Przedsiebiorstwo Handlowe Uslugowe R&S Spolka z o.o.	Boguszow, Stanislawow deposits near Boguszow-Gorce	3.[e]
Cadmium, refined metric tons	Huta Cynku "Miasteczko Slaskie" S.A.	Miasteczko Slaskie	500.
Cement	Gorazdze Cement S.A. (Heidelberg Cement AG, 100%)	Chorula	2,800 clinker, 4,100 cement.[e]
Do.	Grupa Ozarow S.A. (CRH plc., 100%)	Plants at Ozarow and Rejowiec	2,800 clinker,[e] 3,250 cement.[e]
Do.	Cemex Polska Sp. z o.o.	Plants at Chelm and Rudniki	2,300 clinker,[e] 3,000 cement.[e]
Do.	Cementownia Warta S.A. (Polen Zement Beteiligungsgeselschaft GmbH)	Dzialoszyn	1,400 clinker,[e] 2,000 cement.[e]
Do.	Lafarge Cement S.A.	Plants at Malogoszcz and Piechcin	3,000 clinker,[e] 4,800 cement.
Do.	Dykerhoff Polska	Sitkowka-Nowiny	1,100 clinker,[e] 1,600 cement.
Do.	Cementownia "Nowa Huta" S.A.	Krakow	300 clinker,[e] 500 cement.[e]
Do.	Cementownia "Odra" S.A.	Opole	400 clinker,[e] 800 cement.[e]
Cement, aluminous	Gorka Cement Sp. z o.o.	Trzebinia	70 clinker,[e] 70 cement.[e]
Coal:			
Bituminous	Includes:	Of which:	90,000.[e, 3]
	100% Government owned:		
	Kompania Weglowa S.A.	Upper Silesia (16 mines)	
	Jastrzebska Spolka Weglowa S.A.	Upper Silesia (6 mines)	
	Katowicki Holding Weglowy S.A.	Upper Silesia (5 mines)	
	Poludniowy Koncern Weglowy S.A.	Upper Silesia (2 mines)	
	KWK Kazimierz-Juliusz Sp. z o. o.	Upper Silesia (1 mine)	
	Lubelski Wegiel Bogdanka S.A. (Government, 13.84%)	Bogdanka, east of Leczna, eastern Poland (1 mine)	
	SILTECH Sp. z o. o.	Upper Silesia (1 mine)	
Brown coal and lignite	Includes:	Of which:	75,000.[e, 3]
	PGE KWB Belchatow S.A. [PGE Polish Energy Group Plc. (Government, 69.29%)]	Belchatow, south of Lodz (2 open pit mines)	
	PGE KWB Turow S.A. (PGE Polish Energy Group Plc. (Government, 69.29%)]	Bogatynia, at the southwest corner of Poland (1 mine)	
	KWB Konin S.A. (Government)	Konin (4 open pit mines)	
	KWB Adamow S.A. (Government)	Turek (3 open pit mines)	
	KWB Sieniawa Sp. z o.o.	Sieniawa (1 mine)	
Coke	Includes:	Of which:	9,700.[3]
	Zaklady Koksownicze Zdzieszowice (ArcelorMittal Poland S.A., 100%)	Upper Silesia (Zdzieszowice)	
	Zaklady Koksownicze Przyjazn Sp. z o.o.	Upper Silesia (Dabrowa Gornicze)	
	Kombinat Koksochemiczny Zabrze S.A.	Upper Silesia (Cokeries at Jadwiga, Radlin, and Debiensko)	
	ArcelorMittal Poland S.A.	Upper Silesia (Krakow)	
	ISD Huta Czestochowa Sp. z o.o.	Upper Silesia (Czestochowa)	
	Zaklady Koksownicze "Victoria" S.A.	Upper Silesia (Walbrzychu)	
	BO-CARBO Sp. z o.o.	Upper Silesia (Bytom)	

See footnotes at end of table.

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TABLE 2—Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Copper:			
Ore, gross weight (averaged 1.64% Cu)	KGHM Polska Miedz S.A. (Government, 31.79%)	Lubin Mine, Lubin-Glogow District	7,000.
Do.	do.	Polkowice-Sieroszowice Mine, Lubin-Glogow District	11,000.
Do.	do.	Rudna Mine, Lubin-Glogow District	12,000.
Concentrate, gross weight (averaged 22.8% Cu)	do.	Lubin beneficiation plant, Lubin-Glogow District	500.
Do.	do.	Polkowice beneficiation plant, Lubin-Glogow District	600.
Do.	do.	Rudna beneficiation plant, Lubin-Glogow District	1,050.
Metal, refined	do.	Refineries at Glogow I, Glogow II, and Legnica	540.
Feldspar	Strzeblowskie Kopalnie Surowcow Mineralnych Sp. z o.o.	Sobotka, Lower Silesia, exploiting the Pagorki Zachodnie, Pagorki Wschodnie, and Strzeblow I deposits	500.
Do.	Pol-Skal Sp. z o.o.	Karpniki, southwestern region of Jelenia Gora	100.
Ferroalloys:			
Electric furnace (FeSiMn, FeMn, FeSi)	Huta Laziska S.A.	Upper Silesia at Laziska Gorne	120.[e]
Blast furnace (FeMn)	STALMAG Sp. z o.o.	Upper Silesia at Ruda Slaska	50.[e]
Gold, metal kilograms	KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	1,700.[e]
Gypsum and anhydrite	Includes: Zaklady Przemyslu Gipsowego "Dolina Nidy" S.A. Rigips Polska Stawiany Sp. z o.o. Kopalnia Gipsu i Anhydrytu "Nowy Lad" Sp. z o.o.	Of which: Southeastern Poland, Gacki Southeastern Poland, Szarbkow Lower Silesia, mines at Niwnice and Iwiny	1,400.[3]
Helium million cubic meters	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 84.75%)	Western Poland, Odolanow	3.
Kaolin, crude and washed	KSM "Surmin-Kaolin" S.A.	Lower Silesia, Nowogrodziec	90.[e]
Do.	Grudzen Las Sp. z o.o.	Grudzen Las, in Lodz Voivodeship	55.[e]
Do.	Tomaszowskie Kopalnie Surowcow Mineralnych "Biala Gora" Sp. z o.o.	Smardzewice, Tomaszowski Voivodeship	30.[e]
Lead-zinc:			
Mine output	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Government, 100%)	Mine and concentrator at Olkusz and Pomorzany, Bukowno region	30 lead,[e] 110 zinc.[e]
Metal:			
Pb, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A.	Refinery at Miasteczko Slaskie	35.
Do.	"Baterpol" Sp. z o.o. (Impexmetal S.A.)	Refinery at Katowice	30.
Do.	Orzel Bialy S.A.	Refinery at Bytom	40.
Do.	KGHM Polska Miedz S.A. (Government, 31.79%)	Smelter at Legnica	35.
Zn, refined	Huta Cynku Miasteczko Slaskie (HCM) S.A.	Imperial smelter at Miasteczko Slaskie	85.
Do.	Zaklady Metalurgiczny Silesia S.A.	Refinery at Katowice	12.
Do.	Zaklady Gorniczo-Hutnicze (ZGH) "Boleslaw" S.A. (Government, 100%)	Refinery at Boleslaw	75.
Lime	Includes: Zaklady Przemyslu Wapienniczego (ZPW) Trzuskawica S.A. (CRH plc, 100%) Lhoist Group: Lhoist Opolwap S.A. Lhoist Bukowa Sp. z o.o. Zaklad Wapienniczy Wojcieszow Sp. z o.o. Zaklady Wapiennicze Lhoist Sp. z o.o.	Of which: Plants in Sitkowka-Nowiny and Bielawy Tarnow Opolski, Opole County Bukowa, 90 kilometers north of Krakow Wojcieszow Gorazdze	2,200.[e,3]
Natural gas million cubic meters	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.44%)	Gasfields in southeastern Poland in the Carpathians, the Carpathian Foreland, and the Polish Lowlands regions	4,300.[e]
Do. do.	LOTOS Petrobaltic S.A. (Grupa LOTOS S.A.)	Baltic Sea Shelf	30.[e]
Do. do.	FX Energy, Inc.	Western Poland	70.[e]

See footnotes at end of table.

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TABLE 2—Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies	Location of main facilities	Annual capacity
Nitrogen:				
Ammonia (NH_3)		Includes:	Of which:	2,600.[e, 3]
		Zaklady Azotowe "Pulawy" S.A.	Pulawy in eastern Poland	
		Zaklady Azotowe "Kedzierzyn" S.A.	Kedzierzyn in Upper Silesia	
		Zaklady Azotowe "Anwil Wloclawek" S.A.	Wloclawek in central Poland	
		Zaklady Azotowe S.A. w Tarnowie	Tarnow in southern Poland	
		Azoty-Adipol S.A. (former Chorzow plant)	Chorzow in Upper Silesia	
		Zaklady Chemiezne "Police"	Police in northwestern Poland	
Petroleum:				
Crude	thousand 42-gallon barrels	Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.44%)	Oilfields in southeastern and western Poland with about 75% of production from the Barnowko-Mostno-Buszewo field near Debno	4,000.[e]
Do.	do.	LOTOS Petrobaltic S.A. (Grupa LOTOS S.A.)	Baltic Sea Shelf	1,500.[e]
Do.	do.	FX Energy, Inc.	Western Poland	70.[e]
Refined	do.	Petrochimia-Plock (PNK Orlen S.A.)	Plock in central Poland	115,000.
Do.	do.	Rafineria "Gdansk" (Grupa LOTOS Group S.A.)	Gdansk in northern Poland	50,000.
Do.	do.	Rafineria "Trzebinia" (PNK Orlen S.A.)	Trzebinia in southern Poland	3,000.
Do.	do.	Rafineria "Jedlicze" (PNK Orlen S.A.)	Jedlicze in southern Poland	1,000.
Rhenium:				
Rhenium content of ammonium perrhenate	kilograms	KGHM Ecoren S.A. [KGHM Polska Miedz S.A. (Government, 31.79%)]	Lubin	5,000.
Rhenium metal	do.	do.	do.	3,500.
Salt:		Includes:	Of which:	5,000.[e, 3]
Brine		Inowroclawskie Kopalnie Soli Solino S.A.	Mines at Gora and Mogilno in central Poland	
		Polskie Gornictwo Naftowe i Gazownictwo S.A. (PGNiG) (Government, 72.94%)	Mine at Mogilno in central Poland	
		Kopalnia Soli "Wieliczka" S.A.	Wieliczka in southern Poland, near Krakow, mining deposits at Barycz and Wieliczka	
Rock salt		Kopalnia Soli "Klodawa" S.A.	Klodawa in central Poland	
		KGHM Polska Miedz S.A. (Government, 31.79%)	Sieroszowice in southwestern Poland	
Desalination of mine waste water		Zaklad Odsalania Wod Dolowych "Debiensko" Sp. z o.o.	Czerwionka-Leszczyny, west of Debiensko	
Selenium		KGHM Polska Miedz S.A. (Government, 31.79%)	Refinery at Glogow	90.
Silver, refined	metric tons	do.	Precious metals plant at the Glogow smelter (refined silver produced from anode slime resulting from electrolytic processing of copper)	1,400.
Do.	do.	Institute of Non-ferrous Metals	Gliwice	30.[e]
Steel, crude		ArcelorMittal S.A., of which:		8,000.
		ArcelorMittal Poland S.A.	Steelworks at Dobrowa Gornicza (former Huta Katowice S.A.), producing pig iron, crude steel, hot-rolled products, and cast steel	
		do.	Steelworks at Krakow (former Huta Sendzimir S.A.), producing pig iron, crude steel, hot-rolled products, cold-rolled products, pipes, cast iron, tinplated sheets, and galvanized sheets	
		ArcelorMittal Warszawa Sp. z o.o.	Steelworks in Warsaw (former Huta "Lucchini-Warszawa" Sp. z o.o.), producing crude steel, special steel, hot-rolled products, and cold-rolled strip	
Do.		CMC Zawiercie S.A. (Commercial Metals Co.)	Steelworks at Zawiercie, producing crude steel, hot-rolled products, cast iron, and cast steel	1,900.[4]
Do.		ISD Huta Czestochowa S.A. (Industrial Union of Donbass Corp.)	Steelworks at Czestochowa, producing crude steel, hot-rolled sheets, pipes, and cast iron	1,000.

See footnotes at end of table.

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TABLE 2—Continued
POLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies	Location of main facilities	Annual capacity
Steel, crude—Continued	Celsa Huta Ostrowiec S.A. (Celsa Group)	Steelworks at Ostrowiec-Swietokrzyski, producing crude steel, rods, hot-rolled products	1,000.[e]
Do.	Ferrostal Labedy Sp. z o.o. (Zlomrex S.A.)	Steelworks at Gliwice, producing crude steel, hot-rolled products, and bars	375.
Do.	Huta Stali Jakosciowych S.A. (Zlomrex S.A.)	Steelworks at Stalowa Wola, producing crude steel, hot-rolled products, cold-rolled sheets	261.
Do.	Huta Batory Sp. z o.o. (Alchemia S.A.)	Steelworks at Chorzow, producing crude steel, special steels, pipes, and tubes	150.[e]
Sulfur	P.P. Kopalnie i Zaklady Chemiczne Siarki "Siarkopol"	Operations at Grzybow, mining the Osiek deposit	800.

[e]Estimated. Do., do. Ditto. NA Not available.

[1]The data presented in this table were compiled, in large measure, from information provided in the Minerals Yeabook of Poland (Bilans Gospodarki Surowcami Mineralnymi w Polsce Na Tle Gospodarki Swiatowej 2009), which was prepared and published by the Department of Mineral and Energy Policy, Mineral and Energy Economy Research Centre of the Academy of Science of Poland, Ministry of Environmental Protection, Natural Resources, and Forestry.

[2]The production of barite at the "Boguszow" barite mine was stopped in 1997 because of large-scale area flooding; production of barite since 1997 has been through the processing of old flotation tailings.

[3]Annual capacity listed is total for all deposits, mines, or companies that produce the commodity.

[4]Production capacity at CMC Zawiercie S.A. was increased to 1.9 million metric tons per year (Mt/yr) from 1.3 Mt/yr. In previous years, steel rolling capacity of 1.3 Mt was mistakenly listed as the crude steel production capacity.

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THE MINERAL INDUSTRY OF PORTUGAL

By Alfredo C. Gurmendi

In 2010, Portugal was a significant world producer of lithium (fifth after Chile, Australia, China, and Argentina), tin (eleventh after China, Indonesia, Peru, Bolivia, Brazil and Congo (Kinshasa), Vietnam, and Australia, Malaysia, and Russia), and tungsten (fifth after China, Russia, Bolivia, and Australia) (Carlin, 2011; Jaskula, 2011; Shedd, 2011).

In 2010, the Portuguese economy reversed the recessive trend of 2008-9, and it is estimated that the country's gross domestic product (GDP) increased by 1.4%, primarily driven by the increased exports of goods and services. Portugal's GDP based on purchasing power parity was $247 billion. The sectors that contributed to the country's GDP were services (74.7%), industry (22.9%), and agriculture (2.4%) (World Trade Organization, 2011).

In 2010, Portugal's exports amounted to $45.5 billion compared with a revised $44.7 billion in 2009 and included such products as machinery and tools (16.2%), crude oil products (9.8%), base metals (7.7%), minerals and mineral products (5.7%), chemical products (4.8%), and others (55.8%). Portugal's leading export partners were Spain (26.7%), Germany (13.1%), France (12.3%), Angola (7.2%), the United Kingdom (5.6%), Italy (3.8%), the United States (3.2%), and others (28.1%). The main export destination was the European Union (EU), whose 27 members received 74.2% of Portugal's exports. Portugal's imports amounted to $68.8 billion compared with $69.8 billion in 2009, and included such products as machinery and tools (19.1%), crude oil products (16.7%), oil products (12.7%), chemical products (10.3%), base metals (7.7%), minerals and mineral products (1.6%), and others (31.9%). Portugal's leading suppliers were Spain (32.4%), Germany (12.7%), France (8.7%), Italy (5.7%), the United Kingdom (5.4%), the Netherlands (3.3%), the United States (1.6%), and others (30.2%). The main import origination point was the EU, whose 27 members supplied 78% Portugal's imports (Federation of International Trade Associations, The, 2011; U.S. Central Intelligence Agency, 2011; U.S. Department of State, 2011; World Trade Organization, 2011).

Portugal's foreign direct investment (FDI) inflow was $47 billion in 2010. This investment went mainly to commerce (36%), petroleum processing (23%), the financial sector (14%), transportation (10%), and others (17%). In 2010, unemployment increased to 10.8% from 9.5% in 2009 (U.S. Central Intelligence Agency, 2011; U.S. Department of State, 2011).

Minerals in the National Economy

Portugal remained one of the EU's leading copper, silver, tungsten, and zinc producers and a significant European producer of other metals, as well as of industrial minerals and mineral fuels. The Portuguese mineral sector was controlled by the Instituto Geologico e Mineiro. The Iberian Pyrite Belt (IPB) in south-central Portugal is an area known to host numerous and very large base-metal deposits. The Aljustrel complex, which is located in the IPB, hosts five known volcanogenic massive sulfide (VMS) deposits; these types of deposits are an important source of copper and zinc. The mine was placed on care-and-maintenance status in 2008. The final feasibility study for Aljustrel estimated total reserves to be 13.8 million metric tons (Mt) at average grades of 5.5% zinc, 1.8% lead, and 63 grams per metric ton (g/t) silver (Direcção Geral de Energia e Geologia, 2011; MBendi Information Services (Pty) Ltd., 2011a, b, d).

Portugal's most valuable metallic mineral resources were copper, silver, tin, tungsten, and zinc. The most valuable resources of industrial minerals were high-quality lithium, marble, pyrites, and rock salt. The country had limited energy resources and depended upon imports for the bulk of its energy needs (Direcção Geral de Energia e Geologia, 2011; MBendi Information Services (Pty) Ltd., 2011a, d; U.S. Energy Information Administration, 2011).

Portugal's mining and mineral processing industries represented about 1% of the GDP in 2010. The mineral sector employed about 31,400, or 0.6% of the labor force total of 5.6 million. As a target for FDI, Portugal was overshadowed by lower cost producers in Asia and Central Europe (Instituto Nacional de Estatística, 2011; U.S. Central Intelligence Agency, 2011).

Production

Portugal's industrial minerals sector was a producer of a variety of materials; the dimension stone and rock salt sectors continued to be particularly important segments of the mineral industry in terms of value and trade. Portugal was one of the leading producers of mined copper, silver, tin, tungsten, and zinc concentrates in the EU and a significant producer of barite and talc (table 1; Direcção Geral de Energia e Geologia, 2011).

Structure of the Mineral Industry

Lundin Mining Corp. of Canada's operations in Portugal included the Lombador copper-zinc project and the Neves-Corvo copper-zinc mine. The company had begun feasibility studies for the development of the Lombador base-metals mine and the expansion of the Neves-Corvo zinc mine, and expanded mining operations at both mines were expected to begin by 2012. Lundin Mining was also set to conduct greenfield exploration for base and precious metals near the Neves-Corvo Mine. Sojitz Beralt Tin & Wolfram (Portugal) S.A. mined tungsten at its Panasqueira Mine, which is located in Beira Baixa Province in the east-central region of Portugal (Lundin Mining Corp., 2011a; 2011b, p. 1-2; MBendi Information Services (Pty) Ltd., 2011d).

Lusosider Aços Planos S.A. and SN Servicos S.A. were Portugal's leading steel producers. Cimentos de Portugal, SGPS, S.A. (CIMPOR) was a regionally significant producer

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of cement. With the exception of copper, dimension stone, and tungsten, production of other minerals and related materials had only domestic significance. Some of the leading mineral-related companies were partially owned or controlled by the Government, and some operations were privately owned. In 2010, Portugal had only two metallic mines in operation—the Neves-Corvo copper mine and the Panasqueira tungsten mine (table 2; Cimentos de Portugal, SGPS, S.A., 2011a, b; Lundin Mining Corp., 2011a; MBendi Information Services (Pty) Ltd., 2011a).

Commodity Review

Metals

Copper and Zinc.—Production from the Neves-Corvo Mine was 74,426 metric tons (t) of copper concentrate in 2010 compared with 86,500 t in 2009, which was a decrease of almost 14%. Neves-Corvo's current production capacity was about 2.2 million metric tons per year (Mt/yr) of ore and 100,000 metric tons per year (t/yr) of copper concentrate. Neves-Corvo produced 6,421 t of zinc in 2010 compared with 501 t in 2009 (table 1; Direcção Geral de Energia e Geologia, 2011). According to the mine's owner, Lundin Mining, as of early 2011, Neves-Corvo's copper-rich ores amounted to 23.3 Mt grading 3.6% copper, 1.0% zinc, 0.3% lead, and 43 g/t silver, and the mine's zinc-rich ores amounted to 42.6 Mt grading 6.9% zinc, 1.7% lead, 0.4% copper, and 62 g/t silver (Instituto Nacional de Estatística, 2011; Lundin Mining Corp., 2011b, p. 1; MBendi Information Services (Pty) Ltd., 2011a).

Tungsten.—Production from the Panasqueira tungsten mine was 799 t in concentrate (W content) in 2010 compared with 823 t in 2009, which was a decrease of almost 3%. The Panasqueira Mine was operated by Sojitz and continued to be one of the EU's leading producers of tungsten concentrates with a capacity to produce 1,400 t/yr of tungsten oxide (WO_3) concentrate. According to Sojitz, the mine had proven and probable reserves of 1.4 Mt at a grade of 0.233% WO_3, additional indicated resources of 3.3 Mt at a grade of 0.263% WO_3, and inferred resources of 1.6 Mt at a grade of 0.224% WO_3. The main end-use application for tungsten was in the manufacture of cemented carbides (60%), steel and alloys (21%), electrical and electronics products (11%), and catalysts and pigments (8%) (Direcção Geral de Energia e Geologia, 2011; MBendi Information Services (Pty) Ltd., 2011d).

Industrial Minerals

Cement.—Portugal produced 7.2 Mt of cement in 2010 compared with almost 6.9 Mt in 2009. CIMPOR continued to be Portugal's leading cement producer and the second ranked cement producer on the Iberian Peninsula after Cemex España S.A. In addition to cement, CIMPOR also produced aggregates, dry mortars, and precast concrete products. In line with the world economy, 2010 was a year of transition for Portugal's cement industry after the recession of 2009. Domestic cement consumption decreased by 5.6 Mt in 2010 from 6.1 Mt in 2009, or by about 7%. The development of Portugal's infrastructure was expected to increase demand for CIMPOR's products in the foreseeable future, in spite of the financial crisis (Cimentos de Portugal, SGPS, S.A., 2011a-c).

Salt.—Rock salt was the most valuable of the industrial minerals produced in Portugal. The production of rock salt totaled 618,961 t in 2010 compared with a revised 594,578 t in 2009 (Direcção Geral de Energia e Geologia, 2011).

Mineral Fuels and Other Sources of Energy

Petroleum, Natural Gas, and Coal.—In 2010, Portugal continued to rely on imported energy resources, such as petroleum (75%), natural gas (10%), and coal (5%) for electricity generation. The country's leading domestic energy resource was hydropower, which is an unreliable source of power because it depends on rainfall. Portugal had two crude oil refineries, which were located in the coastal cities of Porto and Sines. Argus Resources Ltd. of the United Kingdom built the petroleum refinery located 90 kilometers south of Lisbon at Sines; the refinery had a production capacity of 250,000 barrels per day (bbl/d) and cost about $5 billion to build. Government-owned Petróleos de Portugal (Petrogal) operated both refineries, which had a combined capacity of 304,200 bbl/d. The Government was planning to invest about $2 billion to upgrade the country's refining processes during 2011-12. The political and legal issues surrounding the EU-Russia energy relationship continued to be under review, owing to the 2009 disruption of gas supply to the EU by way of Ukraine, which raised questions concerning the reliability of the energy supply from Russia. Production data for mineral fuels and refined products are shown in table 1 (MBendi Information Services (Pty) Ltd., 2011c; U.S. Energy Information Administration, 2011).

Renewable Energy.—Owing to Portugal's heavy dependence on imported energy, the country was emphasizing solar, wave, and wind power investment. The Government was planning to invest about $11 billion in renewable energy projects by 2012, of which $2.5 billion would be for building the infrastructure for wind power. In 2010, the wind power production capacity in Portugal increased to 3,898 megawatts (MW) from 3,535 MW in 2009. The leading European countries with wind power installations were Germany (27,214 MW), Spain (20,676 MW), Italy (5,797 MW), France (5,660 MW), the United Kingdom (5,204 MW), Portugal (3,898 MW), Sweden (2,163 MW), and Ireland (1,428 MW) (BP p.l.c., 2011, p. 41; European Wind Energy Association, 2011, p. 5–6).

Outlook

Portugal is the EU's leading producer of copper, lithium, rock salt, silver, tungsten, and zinc. Feasibility studies for potential gold and other base-metal projects were under way in the Portuguese zone of the IPB, which continued to be a prime target for exploration. The IPB appears to have good potential for additional mineral deposits on the basis of the large VMS deposits developed in the past. Owing in part to the debt crisis in the eurozone, the Portuguese Government is considering increasing investments in energy alternative sources, such as

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hydropower, solar, wave, wind, and other renewable energy sources to make the country less dependent on imported energy. The Government is also considering improvements in efficiency and performance of energy alternative sources by way of improved technical and operating efficiencies; maintaining a solid financial position to support the country's rating and to keep appropriate levels of leverage among the EU countries (Alexander's Gas & Oil Connections, 2011; MBendi Information Services (Pty) Ltd., 2011d).

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TABLE 1

PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[p]
METALS						
Aluminum, secondary[e]	thousand metric tons	18	18	18	18	18
Arsenic, white[e]		15	15	15	15	15
Beryl, concentrate, gross weight[e]		5	5	5	5	5
Copper, mine output, Cu content		78,660	90,247	89,504 r	86,500	74,426 2
Iron and steel:						
Iron ore and concentrate, manganiferous:[e]						
Gross weight		14,000	14,000	14,000	14,000	14,000
Fe content		10,000	10,000	10,000	10,000	10,000
Metal:[e]						
Pig iron	thousand metric tons	100	100	100	100	100
Steel:						
Crude	do.	1,400	1,400	1,400	1,400	1,400
Hot rolled	do.	800	800	800	800	800
Lead, refined, secondary[e]		3,000	3,000	3,000	3,000	3,000
Manganese, Mn content of iron ore[e]		300	300	300	300	300
Silver, mine output, Ag content	kilograms	20,076	24,167	28,800 r	22,450 2	23,710 2
Tin, mine output, Sn content		25	41	29	34 2	22 2
Tungsten mine output, W content		984	846	982 r	823 2	799 2
Zinc:						
Mine output, Zn content		7,505	24,380	39,224 r	501 2	6,421 2
Metal, primary[e]		--	--	--	--	--
INDUSTRIAL MINERALS						
Barite		24	25	171 r	1,078 2	15 2
Calcium carbonate[e]		100,000	100,000	100,000	100,000	100,000
Cement, hydraulic	thousand metric tons	8,340	12,631	6,650	6,900 3	7,200 3
Clays:						
Kaolin[4]		167,792	183,598	231,346 r	274,925 r	284,715 2
Refractory		307,512	320,253	NA	NA	NA
Feldspar		257,570	168,606	157,539 r	151,976 r	113,327 2
Gypsum and anhydrite		366,590	418,035	372,731 r	335,189 r	NA 2
Lime, hydrated and quicklime[e]		200,000	200,000	200,000	200,000	200,000
Lithium minerals, lepidolite		28,497	34,755	34,888 r	37,359 r	40,609 2
Nitrogen, N content of ammonia[e]		244,000	244,000	244,000	244,000	244,000
Pyrite and pyrrhotite, including cuprous, gross weight[e]		8,000	8,000	8,000	8,000	8,000
Salt, rock		586,190	590,588	606,545 r	594,578 r	618,961 2
Sand	thousand metric tons	8,757	9,849	NA	9,585 r	NA 2
Sodium compounds, n.e.s.:[e, 5]						
Soda ash		150,000	150,000	150,000	150,000	150,000
Sulfate		50,000	50,000	50,000	50,000	50,000
Stone:						
Basalt		384,138	398,767	NA	326,730 r	NA 2
Calcareous:						
Dolomite	thousand metric tons	1,136	1,035	NA	144 r	NA 2
Limestone, marl, calcite	do.	48,015	48,955	NA	43,277 r	NA 2
Marble	do.	837	741	578 r	572 r	NA 2
Gabbro[e]	do.	100	100	100	100	100
Granite:						
Crushed	do.	26,779	NA	NA	NA	NA
Ornamental	do.	710	1,020	877 r	934 r	NA 2
Graywacke	do.	253	189	NA	NA	NA
Ophite	do.	43	42	NA	NA	NA
Quartz	do.	5	7	9 r	35 r	31 2
Quartzite	do.	197	78	NA	NA	NA

See footnotes at end of table.

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TABLE 1—Continued

PORTUGAL: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[p]
INDUSTRIAL MINERALS—Continued						
Stone—Continued:						
Schist	thousand metric tons	156	820	NA	679 [r]	NA [2]
Slate	do.	35	38	38 [r]	20 [r]	NA [2]
Syenite	do.	159	131	NA	NA	NA
Sulfur, byproduct, all sources[e]		25,000	25,000	25,000	25,000	25,000
Talc		5,517	12,367	11,220 [r]	11,567	11,951 [2]
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical[e]	thousand metric tons	300	300	300	300	300
Gas, manufactured[e]	thousand cubic meters	125	125	125	125	125
Petroleum production[6]	thousand 42-gallon barrels	1,822	2,321	2,730	1,728	1,723
Petroleum refinery products:[e]						
Liquefied petroleum gas	thousand 42-gallon barrels	4,616	4,176	4,444	4,450	4,450
Gasoline	do.	23,036	21,683	17,805	18,000	18,000
Kerosene and jet fuel	do.	--	6,516	6,508	6,500	6,500
Distillate fuel oil	do.	37,710	35,396	34,846	35,000	35,000
Residual fuel oil	do.	22,234	19,834	19,099	19,000	19,000
Unspecified	do.	15,599	15,323	15,709	16,000	16,000
Refinery fuel and losses	do.	3,800	3,800	3,800	3,800	3,800
Total	do.	106,995	106,728	102,211	102,750	102,750

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [p]Preliminary. [r]Revised. do. Ditto.

NA Not available. -- Zero.

[1]Table includes data available through July 31, 2011.

[2]Reported figure.

[3]Reported by Cimentos de Portugal, SGPS, S.A. (CIMPOR).

[4]Includes washed and unwashed kaolin.

[5]Not elsewhere specified.

[6]Reported figure. Source: U.S. Energy Information Administration 2006–10.

Source: USGS Minerals Questionnaires, Portugal, 2007–8 and 2009–10.

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TABLE 2
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Calcium carbonate		Omya Mineral Portuguesa Lda. (Salmon & Cia Lda.)	Mine and plant at Fatima	100
Cement		Cimentos de Portugal, SGPS, S.A. (CIMPOR) (Government, 100%)	Plants (3) at Alhandra, Loule, and Souselas	12,000
Copper, concentrate		Lundin Mining Corp.	Neves Corvo Mine near Castro Verde	100
Do.		do.	Aljustrel Mine near Castro Verde	20
Diatomite		Sociedade Anglo-Portugesa de Diatomite Lda.	Mines at Obidos and Rolica	150
Feldspar		A.J. da Fonseca Lda.	Seixigal Quarry, Chaves	10
Ferroalloys		Electrometalúrgia S.A.R.L.	Plant at Setubal	100
Kaolin		Saibrais Arelas e Caulinos S.A. (Denain Anzin Mineraux S.A.)	Mines at Casal dos Bracais and Mosteiros	175
Petroleum, refined	42-gallon barrels per day	Petróleos de Portugal (Petrogal) (Government, 100%)	Refineries at Porto and Sines	305,000
Do.	do.	Argus Resources Ltd. (private, 100%)	Refinery at Sines	250,000
Pyrite		Pirites Alentejanas S.A. (EuroZinc Mining Corp.)	Mine at Aljustrel, plant at Setubal	100
Steel, crude		SN Servicos S.A. (Metalúrgica Galaica S.A., 100%)	Steelworks at Maia and Seixal	600
Do.		Lusosider Aços Planos S.A. (Corus Group, 50%, and Sollac S.A., 50%)	Rolling mill at Seixal	800
Tin		Primary Metals Corp.	Neves Corvo Mine near Castro Verde	15
Tungsten, concentrate	metric tons	Beralt Tin & Wolfram (Portugal) SARL	Panasqueira Mine and plant at Barroca	1,400
Uranium	do.	Empresa Nacional de Uranio S.A. (Government, 100%)	Mines at Guargia, plant at Urgeirica	150
Zinc, concentrate	do.	Lundin Mining Corp.	Neves Corvo Mine near Castro Verde	25,000
Do.	do.	do.	Aljustrel Mine near Castro Verde	20
Zinc, refined	do.	RMC Quimigal S.A.R.L.	Electrolytic plant at Barreiro	12

Do., do. Ditto.

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The Mineral Industry of Romania

By Alberto Alexander Perez

Romania's mineral production was not significant in terms of world production, and the industry was dependent on imports of mineral ores and concentrates to produce refined metals. European Union (EU) membership was achieved on January 1, 2007, which prompted the cessation or steep decline of metallic ore mining activities for copper, iron ore, lead, and zinc and the necessity for some production facilities either to modernize to meet EU standards or to close. Membership in the EU increased the Romanian mineral industry's access to European markets and created investment and trade opportunities. Romania's mineral facilities, however, will require the modernization of existing production facilities and investment in new facilities to be competitive in a global economy.

Minerals in the National Economy

Romania's gross domestic product (GDP) based on purchasing power parity decreased by 1.3% to $254.2 billion in 2010 from $257.4 billion in 2009. Industrial production made up about 37.6% of the GDP. It was not reported, however, what percentage of this amount was from mining and quarrying and metal production activities. Mining and quarrying activities employed about 73,000 people in 2009, which was the latest year for which information was available; the manufacture of basic metals employed about 40,000 people in 2009 (National Institute of Statistics, 2010, p. 1, 100–101, 138; U.S. Central Intelligence Agency, 2011).

Production

Production growth of most mineral commodities was mixed, and included significant estimated increases in the production of alumina (by 923%), crude steel (35%), lead metal (17%), pig iron (more than 9.6%) and aluminum (20%) and an estimated decrease in the production of zinc metal (by 33%); manganese production ceased. Uranium mine production was added to table 1 based on production numbers published by the World Nuclear Association. The addition of uranium production does not indicate new mining.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Romania had two alumina plants. The plant owned by Alum S.A., which was part of the Vitmetco N.V. of the Netherlands, was located in Tulcea, and the plant owned by Cemtrade [a company owned by the Central European Aluminum Company Group (CEAC), which was a managing agent for the En+ Group of Russia] was located in Oradea. In late 2009, alumina production was restarted at the Alum plant, which had been closed for modernization in 2007. The plant produced an estimated 450,000 metric tons (t) in 2010. The Cemtrade alumina plant at Oradea, which had originally stopped production in 2006, was still shut down in 2010. CEAC reported that the plant was in the process of being divested from the En+ Group (Central European Aluminum Co., 2011; Vimetco N.V., 2011).

Gold.—In December, the Romanian court granted Gabriel Resources Ltd. of Canada a validation of its permits that had been challenged by groups opposing the development of the Rosia Montana gold project in northwestern Romania. Development of the project was put on hold when the technical review of the company's environmental impact assessment (EIA) by the Ministry of Environment was suspended in September 2007; the review was restarted in late 2010. Gabriel Resources reported proven reserves of 5.9 million troy ounces (184 t) of gold and 32.6 million troy ounces (1,014 t) of silver, and probable reserves of 4.2 million troy ounces (131 t) of gold and 15 million troy ounces (467 t) of silver. The company estimated that the project could produce an average of 511,000 troy ounces per year (15.89 metric tons per year) of gold during a 16-year mine life and make Romania a significant European gold producer (Gossage and others, 2009, p. 3; Gabriel Resources Ltd., 2010, 2011).

Lead and Zinc.—Sometra S.A., which was Romania's only primary producer of lead and zinc metal, was owned by Mytilineos Holdings S.A. of Greece. The company had suspended production in January 2009 owing to reduced demand for its products and to difficulty in obtaining lead and zinc concentrates. As of December 31, the production facility remained closed, although the company stated that this closure was temporary (Mytilineos Holdings S.A., 2011, p. 30).

Industrial Minerals

Cement.—Although cement production decreased significantly, reported cement production capacity increased by 2.8 million metric tons per year (Mt/yr) to 16.9 Mt/yr owing to investments made in existing plants. Holcim (Romania) S.A. increased the capacity of its plants by 1 Mt/yr, Carpatcement Holding S.A. increased the capacity at its plant at Bicaz by 1.4 Mt/yr, and Lafarge Ciment S.A. increased the capacity at its plants by 0.4 Mt/yr (HeidelbergCement AG, 2010, p. 67; Holcim Ltd., 2010, p. 187; Lafarge S.A., 2010, p. 30).

Outlook

Romania's mineral commodity production recovered in 2010, in particular the alumina and aluminum sectors, while the steel

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sector recovered only partially, mostly driven by international demand of its mineral products. Increased production will most likely depend on the improvement of the European economy. Modernization of facilities to meet EU standards will likely be a priority for the industry as it moves to become more competitive in the world markets. It is likely that foreign investors will become more attracted to investing in the mineral industry in Romania as the country continues its process of modernization. Also, Romania's access to the EU markets is a big asset for the mineral industry, and will continue to be so in the future.

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TABLE 1

ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Alumina, calcined, gross weight		622,083	23,097	--	44,000	450,000 e
Aluminum:						
Primary		255,800	262,505	264,752	201,000	240,000 e
Secondary		10,524	11,674	12,149	10,544	13,996
Total		266,324	274,179	276,901	211,544	253,996
Copper:						
Mine output, Cu content of concentrate		12,132	2,213	2,000 e	1,000 e	5,000 e
Metal, refined:						
Primary		18,600	15,589	12,000	3,000 r	3,000
Secondary[e]		3,000	3,000	3,000	1,000 r	1,000
Total[e]		21,600	18,600	15,000	4,000	4,000
Gold, mine output, Au content[e]	kilograms	400	400	400	400	400
Iron and steel:						
Iron ore:						
Gross weight	thousand metric tons	123	45 e	-- e	--	--
Metal content	do.	40	11	--	--	--
Metal:						
Pig iron	do.	3,946	3,923	2,945	1,575 r	1,726
Ferroalloys, electric furnace:						
Ferrochromium[e]		--	--	6,000	15,000	14,000
Ferromanganese		3,329 3	--	--	--	--
Silicomanganese[e]		53,085 3	26,868 3	10,000	--	20,000
Total[e]		56,414 3	26,868 3	16,000	15,000	34,000
Steel, crude	thousand metric tons	6,266	6,261	5,035	2,761 r	3,721
Finished products:[e]						
Pipes and tubes	do.	580 3	620	850	450	678
Rolled products	do.	5,696 3	5,589 3	4,500	2,800	3,750
Lead:						
Mine output, Pb content of concentrate		6,269	800	--	--	--
Smelter, primary[e]		7,000	800	--	--	--
Refined:						
Primary		29,130	34,368	34,000	9,000	11,000
Secondary[e]		5,000	5,000	5,000	3,000	3,000
Total[e]		34,100	39,400	39,000	12,000	14,000
Manganese, Mn content of ore:[e]						
Gross weight	thousand metric tons	65	55	50	15	--
Mn content	do.	13 3	11	10	3	--
Silver, mine output, Ag content[e]		18	18	18	18	--
Zinc:						
Mine output, Zn content of concentrate		8,052	1,000	--	--	--
Metal, refined, primary and secondary		44,000	58,000	62,000 e	300 r	200
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	8,253 3	10,000	11,000	7,800	7,000 3
Clays:						
Bentonite, marketable		21,165	16,911	16,643	13,756	20,000 e
Kaolin, marketable		11,063	7,576	3,166	1,000 e	500
Diatomite[e]		1,719 3	2,000	--	--	--
Feldspar[e]		33,100 3	45,000	25,000	14,000	6,500
Fluorspar[e]		15,000	15,000	15,000	15,000	15,000
Graphite		--	--	-- e	20,000 e	7,000
Gypsum	thousand metric tons	615	707	885	600	600 e
Lime[e]	do.	1,942 3	2,000	2,000	1,600	1,700
Nitrogen, N content of ammonia[e]	do.	1,300	1,300	1,300	40 r	80

See footnotes at end of table.

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TABLE 1—Continued

ROMANIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Salt:[e]						
Rock	thousand metric tons	47 [3]	51 [3]	50	40	40
Other	do.	2,574 [3]	2,424 [3]	2,400	2,000	2,400
Total	do.	2,621 [3]	2,475 [3]	2,450	2,040	2,500
Sand and gravel[e]	do.	2,421 [3]	5,000	5,000	3,000	2,700
Sodium compounds:						
Caustic soda[e]	do.	477 [3]	475	650	300	300
Soda ash, manufactured, 100% Na_2CO_2 basis	do.	453	453	450 [e]	400 [e]	350
Sulfuric acid[e]		500	-- [3]	--	500	400
Talc[e]		2,967 [3]	1,450	1,700	500	275
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite[e]	thousand metric tons	35,000	32,500	35,000	30,000	30,000
Coke, metallurgical	do.	1,790	1,558 [3]	1,080	320	--
Gas, natural, gross:						
Associated[e]	million cubic meters	1,088 [3]	1,100	1,000	1,000	1,000
Nonassociated[e]	do.	10,854 [3]	11,100	10,400	9,860	9,800
Total	do.	11,942	12,245	11,400 [e]	10,860	10,800
Petroleum:[e]						
Crude[4]	thousand 42-gallon barrels	37,800	38,200	36,000	33,700	33,000
Refinery products[5]	do.	113,000	109,000	112,000	97,300	95,000
Uranium, U_3O_8 content[e]		106	91	91	88	88

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through November 2, 2011.

[2]In addition to the commodities listed, a variety of construction materials are produced; antimony, asbestos, bismuth, and pyrites may have been produced and molybdenum may have been produced as a byproduct of copper from 1988 on; however, available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Figures converted to barrels from production in metric tons, which was reported as the following: 2006—5,030,000; 2007—5,086,000; 2008—4,798,000; 2009—4,494,000; and 2010—4,490,000 (estimate)

[5]Figures converted to barrels from production in metric tons, which was reported as the following: 2006—14,096,000; 2007—13,648,000; 2008—13,974,000; 2009—12,165,000; and 2010—12,000,000 (estimate).

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TABLE 2
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Cemtrade (Part of CEAC Group)	Plant at Oradea, near Hungarian border	250 [1]
Do.	Alum S.A. (Vimetco N.V., 99.4%)	Plant at Tulcea, Danube Delta	600
Aluminum:			
Primary	Alro S.A. (Vimetco N.V., 88%)	Slatina, 120 kilometers west of Bucharest	265
Secondary	Neferal S.A. (Member of Metanef Group)	Bucharest	NA
Cement	Holcim (Romania) S.A. (Holcim Ltd., 100%)	Plants at Alesd, Campulung, and Turda	5,700
Do.	Carpatcement Holding S.A. (HeidelbergCement AG, 99%)	Plant at Bicaz, northeastern Romania	3,000
Do.	do.	Plant at Fieni, 90 kilometers northwest of Bucharest	1,650
Do.	do.	Plant at Deva, western Romania	1,650
Do.	Lafarge Ciment S.A. (Lafarge S.A., 99%)	Plants at Hoghiz and Medgidia	4,900
Coal:			
Bituminous	Compania Nationala a Huilei-Petrosani (Government)	7 mines located near Petrosani	3,500 [e]
Lignite	Societatea National a Lignitului Oltenia (Government)	Tismana I-II, Garla-Rovinari Est, and Pinoasa opencast mines at Rovinari	8,000 [e]
Do.	do.	Rosia, Pesteana Nord, and Pesteana Sud-Urdari opencast mines at Balteni	6,900 [e]
Do.	do.	Udari underground mine at Udari	300 [e]
Do.	do.	Jilt Sud and Jilt Nord opencast mines at Matasari	7,000 [e]
Do.	do.	Dragotesti underground mine at Matasari	600 [e]
Do.	do.	Lupoaia and Rosiuta opencast mines at Motru	5,000 [e]
Do.	do.	Plostina, Horasti, and Lupoaia underground mines at Motru	1,600 [e]
Do.	do.	Seciuri, Oltet, Berbesti-Vest, and Panga opencast mines near Berbesti	2,000 [e]
Do.	do.	Albeni underground mine at Bolbocesti	555 [e]
Do.	do.	Husnicioara-Vest opencast mine near Drobeta Turnu Severin	2,500 [e]
Do.	do.	Zegujani underground mine about 18 kilometers northeast of Drobeta Turnu Severin	600 [e]
Do.	Societatea National a Carbunelui Ploiesti (Government)	8 mines located near Campulung, Baraolt City, Sarmasag, Popesti Commune, Comanesti Commune, Filipestii de Padure Commune, Sotanga Commune, and Borsec City	3,000 [e]
Do.	SC Complexul Energetic Craiova SA (Government, 73%)	Prigaria Mine	1,000 [e]
Coke	ArcelorMittal Galati (ArcelorMittal, 100%)	Galati, north of Brail	2,100
Copper:			
Ore (concentrate, Cu content)	Compania Nationala REMIN S.A., Compania Nationala Minvest, and Moldomin S.A. (Government)	Baia Mare, Baia Sprie, and Cavnic Mines, in northwestern area near the Ukrainian border; Rosia Montana, Noud, Borsa Balan, and Lesul Ursului Mines, in east-west arc along along Carpathian range; Rosia Poieni Mine; Moldova Noua	27
Metal	Cuprom S.A. Baia Mare	Smelter and electrolytic refinery at Baia Mare	40
Ferroalloys, ferrochromium	S.C. Feral s.r.l.	Complex at Tulcea	NA
Iron ore	Compania Nationala Minvest (Government)	Mining complex at Hunedoara, in west-central Romania	1,320
Do.	do.	Resita Mining Complex, southwestern Romania	660
Do.	do.	Napoca-Cluj Mining Complex, northwestern Romania on the Somesul River	990

See footnotes at end of table.

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TABLE 2—Continued
ROMANIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Lead:				
In ore		Compania Nationala REMIN S.A. (Government)	Baia Mare Mine, near Ukrainian and Hungarian borders	12
Do.		Compania Nationala Minvest (Government)	Vetel Mine, near Deva	5
Metal		Sometra S.A. (Mytilineos Holdings S.A.)	Copsa Mica, central Romania	18 [2]
Do.		Neferal S.A. (Member of Metanef Group)	Bucharest	25
Natural gas	million cubic meters	SNGN Romgaz S.A. (Government, 85.01%, and Fondul Proprietatea, 14.99%)	Operated more than 150 reservoirs in Moldova, Muntenia, and Transylvania regions	NA
Do.	do.	S.C. OMV Petrom S.A. [OMV AG, 51.01%; Government, 20.64%; Property Fund S.A. (Government), 20.11%]	Approximately 250 commercial oil and gas fields located in southern and western Romania and offshore in the Black Sea	NA
Petroleum:				
Crude		do.	do.	NA
Refined		do.	Arpechim Refinery, just south of Pitesti	3,500
Do.		do.	Petrobrazi Refinery, just south of Ploiesti	4,500
Do.		Rompetrol Rafinarie S.A. (Rompetrol Group)	Refinery at Navodari	4,500
Do.		Vega Ploiesti Refinery (Rompetrol Group)	Refinery just north of Ploiesti	500
Do.		S.C. RAFO S.A.	Refinery at Onesti	3,000 e
Do.		S.C. Petrotel S.A. (OAO Lukoil)	Refinery just east of Ploiesti	2,400
Do.		Astra Refinery	Refinery in Ploiesti	NA
Do.		Refinaria Petrolsub Suplacu de Barcau	Refinery at Suplacu de Barcau	NA
Do.		Darmanesti Refinery	Refinery at Darmanesti in eastern Romania	NA
Steel		ArcelorMittal Galati (ArcelorMittal, 100%)	Galati, north of Brail	4,500 e
Do.		ArcelorMittal Hunedoara (ArcelorMittal, 100%)	Hunedoara, west-central Romania, near Calan	NA
Do.		S.C. Donasid S.A. (Tenaris S.A., 99%)	Calarasi in southeastern Romania	470
Do.		S.C. TMK-Resita S.A. (OAO TMK, 100%)	Resita in southwestern Romania	450
Do.		Mechel Targoviste (OAO Mechel, 87%)	Targoviste	630 e
Do.		Mechel Campia Turzii SA (OAO Mechel, 87%)	Campia Turzii, northwestern Romania	300 e
Do.		Ductil Steel (OAO Mechel, 100%)	Otelu Rosu in southwestern Romania	400 e
Uranium		Compania Nationala a Uraniului (Government)	Suceava county	NA
Zinc:				
In ore		Compania Nationala Minvest (Government)	Baia Mare, near Ukrainian and Hungarian borders	12
Do.		Compania Nationala REMIN S.A. (Government)	Vetel Mine, near Deva	45
Metal		Sometra S.A. (Mytilineos Holdings S.A., 100%)	Copsa Mica, central Romania	62 [2]

Do., do. Ditto. NA Not available.

[1]The Cemtrade alumina plant at Oradea had been shut down since late 2006 and slated to sold by the CEAC Group.

[2]The Sometra S.A. lead and zinc plant stopped production in January 2009 and had not restarted production by the end of the year 2010.

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The Mineral Industry of Russia

By Elena Safirova

Russia was one of the world's leading mineral-producing countries. In 2010, Russia was ranked among the world's leading producers or was a leading regional producer of such mineral commodities as aluminum, arsenic, asbestos, bauxite, boron, cadmium, cement, coal, cobalt, copper, diamond, fluorspar, gold, iron ore, lime, magnesium compounds and metals, mica (flake, scrap, and sheet), natural gas, nickel, nitrogen, oil shale, palladium, peat, petroleum, phosphate, pig iron, platinum, potash, rhenium, silicon, steel, sulfur, titanium sponge, tungsten, and vanadium (Angulo, 2012; Apodaca; 2012a–c; Bray, 2012a, b; Brooks, 2012; Corathers, 2012; Edelstein, 2012; Fenton, 2012; Gambogi, 2012; George, 2012; Jasinski, 2012a, b; Jorgenson, 2012; Kramer, 2012a, b; Kuck, 2012; Loferski, 2012; Miller, 2012a, b; Olson, 2012; Polyak, 2012a, b; Shedd, 2012a, b; Tolcin, 2012; van Oss, 2012; Virta, 2012; Willett, 2012).

Minerals in the National Economy

In 2010, the real gross domestic product (GDP) of Russia increased by 4.3% to 45,166 billion rubles ($1,487 billion[1]), compared with a 7.8% decrease in 2009. Industrial production contributed 36.9% to the total GDP, and the industrial sector accounted for 27.5% of the employment. Mining and quarrying (excluding energy production) employed 898,000 people, or 1.6% of the total number of employed in the country's economy. Mining and quarrying contributed 9.8% to the total value added in the economy in 2010, and the total production volume in current prices amounted to 6,212 billion rubles ($204.4 million), or 13.8% of the GDP (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011a; U.S. Central Intelligence Agency, 2012).

Over the course of 2010, mining and quarrying production increased by 3.6%. Mining and quarrying of fuel and energy products increased at a slower rate, by 3.1%, than did the mining and quarrying of nonenergy minerals, which increased at a rate of 7.3%. Among nonmining industrial sectors, production of chemicals increased by 14.6%; metallurgy and production of finished metal products, by 12.4%; production of other nonmetal mineral products, by 10.7%; and that of coke and petroleum products, by 5.0% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

In 2010, 17% of all investments in the economy were directed to the mining and quarrying industry. Mining and quarrying was one of the most profitable sectors of the economy; the average profitability of the sector was 31.9% whereas the average profitability for all sectors was only 16.2% (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Of Russia's total spending on geologic prospecting, 80.8% went into exploration for oil and gas, 9% into exploration for precious metals, and 1.9% into exploration for diamond. In terms of the sources of financing, 70.4% of exploration spending was financed by the mineral industry, 16.7% came from domestic and foreign investors, and 8.2% was contributed from the Federal budget (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Government Policies and Programs

In 2009, the Ministry of Industry and Trade of Russia announced a new program "Strategy for Development of the Metallurgical Industry for the Period through 2020." The new strategy emphasizes metallurgy as one of the sectors of specialization for Russia in the current international division of labor. The new program was initiated because, despite Russian metallurgy's adaptation to the market economy, the sector's technological level and competitiveness on international markets were thought to be unsatisfactory. The program is designed to improve cooperation between various government entities, the business community, and nongovernmental organizations to increase the technological level of the metallurgical industry and to create a basis for further development of the sector for the period beyond 2020. The strategy document mentions the following cost-increasing trends in the metallurgical sector that were said to have become apparent in the past several years:

- High depreciation of production facilities and equipment;
- Low quality of ores (excluding antimony and nickel);
- Breakdown in the system of replenishing the ore base for the metallurgical sector, in particular, insufficient ferrous ore base for the Urals and Eastern Siberia plants; insufficient ore base for bauxites, rare earths, tin, and tungsten, and for some other specific metals, such as chromium, manganese, and titanium;
- Shortages of some types of final metallurgical products;
- Reductions in the production volumes of certain special types of steel and alloys;
- Lack of small- and medium-sized enterprises that could quickly fill profitable niches;
- High production costs per unit of production, especially in comparison with analogous enterprises in other countries;
- Low labor productivity;
- Insufficient attention to environmental protection;
- Low adaptability for innovations and new technology; and
- Lack of a qualified labor force.

The plan to overcome those problems includes a variety of measures, from support of research and development in metallurgy to improvements in the system of education of specialists in the metallurgical field. One of the most important elements of the strategy is changing the tax code to reduce the tax rate imposed on profits and allowing metallurgical enterprises to reinvest their amortization funds in capital goods faster and with more discretion.

[1]Where necessary, values have been converted from Russian rubles (RUB) to U.S. dollars (US$) at an annual average exchange rate of RUB30.38=US$1.00 for 2010 and RUB31.74=US$1.00 for 2009. All values are nominal, at current prices, unless otherwise stated.

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The outcomes that result from this strategy will be dependent on three scenarios:

- Inertia (business as usual),
- Increased energy and raw materials, and
- Innovation (adoption of new technology).

The outcome under each of the scenarios would depend on the basic economic conditions in Russia and the world and on how successful the early measures of the strategy proved to be. If the innovation scenario is realized, the Ministry expected that the production of titanium in Russia in 2020 compared with that in 2007 would increase by 127.4%; that of zinc, by 90.3%; tin, by 72.4%; steel pipe, by 54%; aluminum, by 48.5%; and refined copper, by 30.0% (Minpromtorg Rossii, 2009).

Production

In 2010, Russia started to increase its production following the recession of 2008–9. Production of silicon metal increased by 103.8%; ferromanganese, by 95.0%; potash, by 68.6%; silicomanganese, by 49.85%; lead mine output, by 38.6%; that of steel pipe, by 37.5%; ferrosilicon, by 23.0%; refined lead, by 21.9%; tungsten concentrate, by 21.7%; zirconium, by 20.0%; zinc mine output, by 19.6%; sulfuric acid, by 18.6%; coal, by 17.7%; cement, by 13.9%; rolled steel, by 13.7%; crude steel, by 12.1%; and natural gas, by 11.6%. At the same time, production of tin mine output decreased by 86.7%, and that of titanium sponge decreased by 30.0%. All other production data are in table 1.

Structure of the Mineral Industry

At the end of 2009, Russia had 9,913 enterprises engaged in mining and quarrying, which was a 1.1% increase compared with the number of enterprises active in mining and quarrying in the previous year. Of these enterprises, 4,342 were engaged in extracting fuel minerals, and the other 5,571 were engaged in mining nonfuel minerals. Out of all mining and quarrying enterprises, only 385 were owned by the Government, 8,330 were owned by Russian citizens, and 837 were either owned by foreign companies or were jointly owned by domestic and foreign entities (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Mineral Trade

In 2010, the total value of Russian exports was $400.4 billion, which was a 31.8% increase compared with the value of exports in 2009. The value of Russian imports also increased in 2010, to $248.7 billion, or by 29.7%. In 2010, Russia had a positive trade balance of $151.7 billion (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

The main export categories for Russia were chemicals, manufactured goods, metals, natural gas, petroleum and petroleum products, and wood and wood products. Mineral products made up 68.8% of the total value of Russian exports, and crude oil alone contributed 33.6% to the total. Petroleum products accounted for another 17.5%; natural gas, 11.9%; and ferrous metals, 5.2%. Among ferrous metals, the leading categories were semifinished products made from carbon steel (33.5%) and flat-rolled iron and steel (29.0%). Other mineral products that contributed significant amounts to Russia's export revenue were bituminous coal (2.3%), aluminum (1.5%), nickel (1.3%), and copper (0.8%). The major export partners of Russia in 2010 were the Netherlands (13.6%); Italy (6.9%); Germany (6.3%); Ukraine (5.8%); China and Turkey (5.1% each); Belarus (4.6%); Poland (3.8%); Japan (3.2%); Finland, France, and the United States (3.1% each); and Kazakhstan and the United Kingdom (2.9% each) (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

In 2010, Russia imported $5,364 million worth of ferrous metals (which constituted 2.1% of the total imports), $6,446 million worth of products made of ferrous metals (2.6%), and $1,987 million worth of petroleum products (0.8%). The major imports partners of Russia were China (17.0%); Germany (11.7%); Ukraine (6.1%); the United States (4.9%); Japan (4.5%); Italy and France (4.4% each); Belarus (4.3%); the Republic of Korea (3.2%); Poland (2.5%); Turkey (2.1%); Finland, Kazakhstan, and the United Kingdom (2.0% each); and the Netherlands (1.9%) (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—All Russian production of alumina, bauxite, and primary aluminum was controlled by United Company RUSAL (UC RUSAL), which was the world's leading producer of alumina and aluminum. UC RUSAL operated 16 aluminum smelters, which were located in four countries: Russia (12 plants), Nigeria (1 plant), Sweden (1 plant), and Ukraine (1 plant). It also operated 12 alumina plants, 8 bauxite mines, 3 plants for producing aluminum powder, 3 plants for producing secondary aluminum, and 3 plants for producing aluminum foil. The combined annual capacity of UC RUSAL's plants was 4.7 million metric tons (Mt) of aluminum, 11.5 Mt of alumina, and 80,000 metric tons (t) of aluminum foil. In 2010, UC RUSAL plants employed about 74,000 people. UC RUSAL owned 25% of the shares of OJSC MMC Norilsk Nickel (Nornickel), which was the world's leading producer of nickel and palladium and one of the world's leading producers of copper and platinum (United Company RUSAL, 2012a, b).

In January, UC RUSAL sold 10.64% of its shares on the Hong Kong stock exchange for $2,238 billion. The buyer that purchased most shares was Vnesheconombank of Russia (the main creditor of UC RUSAL), which purchased 3.15% of the shares (Igumenov and Berezanskaya, 2010). UC RUSAL's main facilities were located in Siberia and accounted for about 85% of the company's aluminum output. Together, the Bratsk and the Krasnoyarsk smelters in Siberia accounted for almost one-half of UC RUSAL's aluminum production, and these smelters were among the leading aluminum smelters in the world. UC RUSAL's aluminum smelters in Siberia had the advantage of access to low-cost and renewable hydroelectric power as their principal source of electricity (United Company RUSAL, 2011).

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UC RUSAL was formed in 2007 by a merger of RUSAL, Siberia-Urals Aluminum Co. (SUAL), and the bauxite assets held by Glencore International AG of Switzerland. Before the merger, SUAL's holdings included the following eight aluminum plants: the Bogoslovsk aluminum plant located in Sverdlovskaya Oblast', the Irkutsk aluminum plant in Irkutskaya Oblast', the Kandalaksha aluminum plant in Murmanskaya Oblast', the Nadvoitsy aluminum plant in the Republic of Kareliya, the Urals aluminum plant in Sverdlovskaya Oblast', the Volkhov aluminum plant and the Pikalyov aluminum plant in Leningradskaya Oblast', and the Volgograd aluminum plant in the city of Volgograd. Raw materials for SUAL's plants were mined at the OAO Sevuralboksitruda and the Sredne-Timanskiy bauxite mine. The resource base of Glencore at the time of the merger was about 3.3 billion metric tons (Gt) of bauxite.

UC RUSAL had plans to further expand its aluminum smelting operation in Siberia with two projects—the BEMO and the Tayshet smelter projects, which together could increase the company's production capacity by an additional 1.3 million metric tons per year (Mt/yr). The BEMO project involved the construction of a 3,000-megawatt (MW)-capacity hydroelectric powerplant and the Boguchanskiy aluminum smelter in the Krasnoyarskiy Kray; the smelter would have the capacity to produce 588,000 metric tons per year (t/yr) of aluminum. The project was to be completed in two stages. The first stage was scheduled for completion by 2013, and the second stage, by the end of 2015. The Tayshet aluminum smelter, which was to be located in Irkutsk, was to have a design capacity to produce 750,000 t/yr of aluminum (United Company RUSAL, 2011). Construction of the smelter had been temporarily suspended owing to financing issues, and UC RUSAL was in the process of negotiating with foreign investors for financing.

Copper.—In 2010, primary refined copper production in Russia increased by 7.2% compared with that of 2009. Production of blister and refined copper took place at four enterprises—Metalloinvest Holding; Nornickel; Ural Mining and Metallurgical Co. (UMMC), and ZAO Russian Copper Co. (RCC). Metalloinvest purchased rights to mine the Udokan deposit in 2009. Copper in ore and concentrate was also produced at a number of enterprises that mined polymetallic ores containing copper. Copper in concentrate production was estimated to have increased by about 4% compared with that of 2009.

At Russia's leading copper-producing enterprise, Nornickel, refined copper production totaled 309,000 t at the Zapolyarnyi division of the company, which was about 4.4% less than the division produced in 2009. In another division, Kola GMK, the company produced 56,000 t of copper, which was 5.4% less than in 2009. As of the beginning of 2010, proven and probable ore reserves on the Kola Peninsula and the Taymyr Peninsula combined were 8.7 Mt of copper; moreover, measured and indicated ore resources on those two peninsulas totaled 16 Mt of copper. Overall, Nornickel copper production accounted for about 2% of the world's production volume (OJSC MMC Norilsk Nickel, 2011).

As of 2010, UMMC was the country's second ranked copper producer. The OAO Gayskiy mining and metallurgical complex was UMMC's largest mining complex in terms of the volume of production. OAO Uralelectromed was the leading enterprise within UMMC. In 2010, it employed more than 8,000 workers at the following four sites: the main production facility in the city of Verkhnyaa Pyshma, Nonferrous Alloys Production in the town Verkh-Neyvinskiy, Polymetall Production in Kirovograd, and Safyan Copper in Rezh, Sverdlovskaya Oblast'. In 2010, Uralelectromed produced 369,043 t of refined copper. A new electrolytic refining shop was under construction at Uralelectromed. The first stage of the shop was planned to go into operation in 2011. UMMC planned eventually to increase its copper cathode production capacity to 500,000 t/yr (OAO Uralelectromed, 2012a, b).

RCC, which was founded in 2004, was the country's third ranked copper cathode producer and second ranked copper wire rod producer. RCC had the capacity to produce 200,000 t/yr of copper cathode and 200,000 t/yr of copper wire rod. In 2010, RCC operated 10 mining and metallurgical enterprises in Russia and Kazakhstan. The major enterprises that composed RCC included the Aleksandrinskaya copper mining company, the ZAO Karabashmed, and the ZAO Kyshtymskiy copper refinery (Russian Copper Co., 2012).

The country's most promising site for increasing copper production was the Udokan deposit in Zabaykal'skiy Kray, which was one of the world's largest undeveloped copper deposits. It had estimated ore resources of 1.375 Gt, estimated copper resources of 19.95 Mt, and estimated silver resources of 11,900 t. On September 10, 2008, Metalloinvest Holding, which also owned Mikhailovskiy GOK, won the tender for Udokan, having offered 15 billion rubles ($473 million) for the license. The company planned to construct mining and metallurgical facilities and to start the first stage of operations in 2014 with an initial production level of 150,000 t/yr of copper cathode. At full production capacity, which was scheduled to be reached in 2016, the mine was expected to produce 36 Mt/yr of copper concentrate and 474,000 t/yr of copper cathode. Government-controlled Rostechnologii was Metalloinvest's partner in this project. Metalloinvest intended to spend $3.4 billion on development of Udokan. The construction of mines and plants was expected to start in the beginning of 2011 (Kommersant.com, 2008; RIA Novosti, 2010).

Gold.—In 2010, gold production in Russia from mine output decreased by about 2% compared with that of 2009. Among the Russian-owned enterprises, the decrease came mainly from two enterprises—ZAO Chukotskaya GGK, which reduced production by 5,700 kilograms (kg), and OAO Pokrovskiy Mine, which decreased production by 2,000 kg. On the other hand, growth in production was achieved by OAO Polimetall, which increased its output by 1,800 kg, and OAO Polyus Zoloto, which increased its output by 1,700 kg. In 2010, foreign companies decreased production in Russia by 13.6%. Kinross Gold Corp. of Canada decreased production by 5,700 kg and Petropavlovsk plc of the United Kingdom decreased production by 900 kg (Braiko and Ivanov, 2011).

In 2010, the largest domestic gold-mining companies in terms of production were Polyus Zoloto (39,700 kg), Chukotskaya GGK (19,900 kg), Polimetall (11,100 kg), Severstal Nordgold NV (9,300 kg), and OOO Russdragmet (5,300 kg). Kinross Gold and Petropavlovsk produced 19,900 kg and 13,900 kg, respectively. In 2010, gold was mined in 24 regions of the

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country, and in 14 of them, production reached or exceeded 1,000 kg. The highest producing regions were Krasnoyarskiy Kray (36,100 kg), Chukotskiy Avtonomnyy Okrug (24,900 kg), Amurskiy Kray (19,900 kg), Sakha Republic (Yakutiya) (18,600 kg), Irkutskaya Oblast' (16,000 kg), Magadanskaya Oblast' (15,400 kg), and Khabarovskiy Kray (15,200 kg) (Rough and Polished, 2011).

The average price of gold per troy ounce in 2010 was $1,224.50, which constituted an increase of 26% compared with the average price in 2009. The Union of Gold Miners of Russia asserted that Russia could mine at least 300,000 kilograms per year of gold if the Government had policies in place that support gold mining. In particular, the Union proposed that regional authorities, in addition to Federal authorities, be permitted to issue licenses for gold mining at deposits with resources of less than 10,000 kg and that extraction taxes for alluvial and technogenic deposits be set to 0% (Zolotonews.ru, 2012).

Iron and Steel.—In 2010, production of crude steel increased by 12% compared with that of 2009 to 66.3 Mt; production of rolled steel increased by 13.7%, and production of steel pipe increased by 37.5%. Pig iron production increased by 9.7% compared with that of 2009 to 48.2 Mt.

Output in the iron and steel industry was highly concentrated in ten enterprises, five of which produced more than 60% of the total crude steel output. OAO Magnitogorsk mining and metallurgical complex (MMK) produced 18%, OAO Severstal produced 17.4%, OAO Novolipetskiy mining and metallurgical complex (NLMK) produced 14.6%. Two enterprises from the EVRAZ group—Zapadno-Sibirskiy mining and metallurgical complex (ZSMK) and Nizhny Tagil metallurgical complex (NTMK)—had 10.8% and 6.1% shares, respectively. In the rolled steel market, the two leaders were OAO MMK and Severstal, with 17.4% and 17.1% shares, respectively. NLMK produced 14.8%, ZSMK produced 9.1%, and NTMK produced 5.9% (Metalresearch.ru, 2011).

The mix of methods used in Russian steel production was still quite different from that prevailing on the world market—the percentage of steel produced in open hearth furnaces was still significant. In 2009, the percentage of steel produced in oxygen converter furnaces reached 64%, steel produced in electric furnaces stood at 27%, and steel produced in open hearth furnaces was 9%. It was projected that the last open hearth furnace would be shut down in Russia around 2020 (Metalinfo.ru, 2011).

Iron Ore.—In 2010, iron ore output increased by 3.8% compared with that of 2009 to 95.5 Mt. In 2010, practically all iron ore in the country was produced by six large companies. The largest of them was Holding Company Metalloinvest (HK Metalloinvest), which owned about 40% of the ore reserves in the country. HK Metalloinvest was the fourth ranked iron ore producer in the world following Vale S.A. of Brazil, BHP Billiton Ltd. of Australia, and Rio Tinto Ltd. of Australia. The share of iron ore production of HK Metalloinvest was about 40%. Three other companies—Evraz Holding, NLMK, and Severstal—together produced 48% of all iron ore in Russia (Mineral.ru, 2008; Dobprom.ru, 2011).

Major producers of iron ore in Russia significantly differed by the amount of ore reserves they owned. The reserves of the four leading companies were quite substantial, but the fifth company—OAO Chelyabinsk mining and metallurgical complex (ChMK) which was a part of Mechel Holding—had reserves of only 400 Mt of iron ore. The Kursk Magnetic Anomaly contained 54.6% of all deposits of iron ore currently mined in the country. Murmanskaya Oblast' and the Republic of Kareliya contained another 18% of the country's deposits; and about 16% were located in Sverdlovskaya Oblast'. Most Russian iron ores were considered medium to poor, with iron content in the range of 16% to 40%. Only about 12% of reserves contained at least 60% of iron (Mineral.ru, 2008; Dobprom.ru, 2011).

Nickel.— Russia was the world's leading nickel mining country in 2010 (Kuck, 2012). Nornickel was the country's leading nickel producer and the world's leading nickel mining company; it produced 18.7% of the world's nickel. Nickel accounted for about 50% of Nornickel's revenues in 2010. Nornickel's operations in Russia were located on the Kola Peninsula in the northwest of the country and in the Noril'sk region on the Taymyr Peninsula in East Siberia. As of December 2009 (the latest year for which the data were available), proven and probable reserves of Nornickel were 8.7 Mt of copper, 5.7 Mt of nickel, 13 million troy ounces (404 t) of platinum, and 55 million troy ounces (1,711 t) of palladium. Nornickel also owned assets in Australia, Botswana, Finland, and South Africa (OJSC MMC Norilsk Nickel, 2011).

In 2010, enterprises of Nornickel produced 297,000 t of nickel, from which Kola GMK produced 111,000 t of nickel, and the Zapolyarnyi division produced 124,000 t. Total production of nickel in Russia was about 269,000 t, which was an increase of 2.9% compared with that in 2009. Nickel was also produced in much smaller amounts at three other producers in the Ural Mountains region—OAO Ufaleynikel, OAO Yuzhuralnikel, and ZAO Rezhnikel (OJSC MMC Norilsk Nickel, 2011; Rbc.ru, 2012).

Nornickel was planning to invest more than $35 billion in its Russian assets through 2025 with an emphasis on an aggressive technological development. The company planned by 2025 to increase the amount of ore mined in its Zapolyarniy division to 29 Mt, and in the Kola GMK, to 9.5 Mt (Rbc.ru, 2012).

Mineral Fuels

Coal.—In 2010, coal production increased by 17.7% compared with that of 2009. Anthracite production increased by about 22.5% to 8.7 Mt, and lignite production increased by about 11% to 76.6 Mt. Bituminous coal production increased by 19.8% and accounted for about 74% of total coal production. In 2010, about 35% of coal was produced by underground mining and 65% was produced by open pit mining. As of 2010, coal was mined at 137 open pits and 91 underground mines. Coal exports increased by 0.4% compared with those in 2009 and amounted to 97.4 Mt. Russian coal was exported to China, Germany, Japan, the Republic of Korea, Turkey, and other countries in Europe (Federal'naya Sluzhba Gosudarstvennoy Statistiki, 2011b).

Russian proven reserves of coal were estimated to be 173 Gt, of which about 70% was brown coal. Probable reserves of coal

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in Russia were estimated to be 4 trillion metric tons. At current levels of extraction (about 300,000 t/yr) Russia had enough reserves for more than 400 years of production. As of 2010, the share of coal used to generate electric power in Russia was about 20%, whereas the world's percentage of coal-fired electric power generation was about twice as high. Because of increasing prices of natural gas, however, the Government was trying to increase the share of coal in power generation. According to the program for siting new powerplants, by 2020, the share of natural gas-powered plants was to decrease to between 30% and 35% from the current 70%, and the share of those powered by coal was to increase to between 31% and 38% from the current 26% (Oilngases.ru, 2012; Protown.ru, 2012).

Despite a continuous growth in demand for coking coal, its production in Russia stayed at a constant level of 70 to 75 Mt/yr. The Russian market of coking coal was dominated by the following three companies: Evraz Group, which owned the Raspdskaya Mine; Sibuglemet Holding; and Southern Kuzbass Coal Co., which was a part of Mechel Holding. These three producers together controlled 57% of the coal market and about 75% of the market of the most valuable hard and semihard types of coal.

Only three of the largest metallurgical enterprises in Russia produced enough coke to meet their own production needs. Evraz Group and Mechel produced enough to supply coal to the open market. Severstal produced just enough to satisfy its own demand. Mechel started mining the Elgin deposit in Sakha (Yakutiya) Republic in 2010 and expected to produce about 2 Mt/yr from the mine (Minerjob.ru, 2010).

Natural Gas.—According to the Oil and Gas Journal, Russia holds the world's largest natural gas reserves, with 1,680 trillion cubic feet (about 47.5 trillion cubic meters), and Russia's reserves account for about one-quarter of the world's total proven reserves. The majority of these reserves are located in the western Siberia economic region at the Medvezh'ye, the Urengoy, and the Yamburg fields, which accounted for about 45% of Russia's total reserves. In 2010, Russia was the world leader in natural gas production, with output of about 651 billion cubic meters; the United States was the world second ranked natural gas producer, with output of 619 billion cubic meters. In 2010, Russian production increased by 11.5%, and Russian exports of natural gas increased by 3.6% to 174 billion cubic meters (U.S. Energy Information Administration, 2010; Enerdata.net, 2011; Protown.ru, 2012).

The leading natural gas producer in Russia, OAO Gazprom, produced 508.6 billion cubic meters per year, or 78% of all production. Gazprom also controlled most of the Russian gas reserves; more than 65% of proven reserves were directly controlled by the company. In 2010, Gazprom invested more than 25 billion rubles ($823 million) in construction of natural gas hookups for Russian households and businesses; the percentage of entities with access to natural gas reached 69.8% during this time period. Gazprom's major producing fields were located in the Yamalo-Nenetskiy Avtonomnyy Okrug in Western Siberia. Gazprom was developing gasfields on the Yamal Peninsula in Western Siberia; the company expected this area to become the company's main gas producing region (U.S. Energy Information Administration, 2010).

The Medvezhye, the Urengoy, and the Yamburg gasfields, which were the country's leading gas-producing fields, had decreasing output in recent years. In response, in late 2008, the Yamal megaproject was launched to develop gas deposits on the Yamal Peninsula. In addition, the Zapolyarnyyi field, which was commissioned in 2001, was expected to offset some of the declines at Gazprom's leading three producing fields. Preparations also were underway by Gazprom for the development of the offshore Shtokman field, which is located in the Barents Sea. The Shtokman project was expected to become a main source of gas to export to Europe through the Nord Stream pipeline (U.S. Energy Information Administration, 2010; OAO Gazprom, 2012).

Gazprom possessed the largest gas transmission system in the world, which included 159,500 kilometers (km) of gas trunk lines. The company was engaged in developing major new pipeline projects, which included the Nord Stream and the South Stream pipelines. The Nord Stream pipeline would create a link with Russia's Baltic Sea coast near Vyborg to Germany's Baltic Sea coast in the vicinity of Greifswald. The pipeline would be 1,224 km in length. Gas supplies shipped through the Nord Stream pipeline would go to Denmark, France, Germany, the Netherlands, the United Kingdom, and other countries. Construction of the first line of the pipeline was started in April 2010 and was expected to be completed in 2011. The planned capacity of the first line of Nord Stream was 27.5 billion cubic meters per year (Nord Stream, 2012; OAO Gazprom, 2012).

The South Stream project was planned to include a section that would lie under the Black Sea from the Russkaya compressor station on the Russian coast to the Bulgarian coast. The total length of the offshore section would be about 900 km and would be at a maximum depth of more than 2 km. To provide the required amount of gas to the South Stream pipeline, gas transmission system capacities in Russia would need to be expanded. A comprehensive preinvestment feasibility study for the pipeline was being conducted by Gazprom (OAO Gazprom, 2012; South Stream, 2012).

Petroleum.—In 2010, Russia increased crude oil production by 1.5% compared with that of 2009. In 2010, Russia was the world's second ranked oil-producing country after Saudi Arabia. Petroleum was a leading export commodity for Russia and provided one-third of the total export revenue for the country. According to the Oil and Gas Journal, Russia's proven petroleum reserves were 60 billion barrels (8.2 Gt). According to those estimates, if Russia continued production at about the same amount per year, it had sufficient reserves for about 20 years of extraction (U.S. Energy Information Administration, 2010).

Russia's eight major oil-producing companies were (in decreasing order of production) OAO Rosneft', OAO Lukoil, TNK-BP, Surgutneftegaz, Gazprom Neft', Tatneft', Slavneft', and Bashneft'. Most of Russia's production was dominated by domestic firms. In 2003, BP invested in TNK plc of the United Kingdom, forming TNK-BP, and became one of Russia's major producers. Later attempts by foreign firms to increase their investment in Russia were unsuccessful, however. In 2010, foreign firms invested in Russian oil production by forming joint ventures with domestic firms, most often with Rosneft'.

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Geographically, most of Russia's oil production comes from Western Siberia. The leading oil producing region in Western Siberia was Khanty-Mansiyskiy Avtonomnyy Okrug. Other large producing regions in Western Siberia were Yamalo-Nenetksiy Avtonomnyy Okrug, Tomskaya Oblast', and south of Tyumenskaya Oblast' at the Uvatskiye group of deposits. About 30% of Russia's oil production in 2010 took place in the European part of the country, namely in the Povolzh'ye (along the Volga) region, in the Republics of Tatarstan and Bashkortostan, and in Samarskaya Oblast'.

Russia had about 40 oil refineries with a combined refining capacity of about 260 Mt/yr and about 80 mini-refineries with a combined refining capacity of 11 Mt/yr. The efficiency of Russian refineries was very low, however. An efficiency indicator commonly used in Russia is the so-called refining depth, which is defined as a ratio of the net processed petroleum [the total processed petroleum minus the sum of mazut (low quality fuel oil) output and refinery waste] to the amount of the total processed petroleum. As of 2006, the average depth of refining at Russian refineries was only 71.3%. In October 2010, the Government adopted a new rule that allows a new refinery to be connected to a major pipeline only if its refining depth equals or exceeds 70%. A new refinery that was currently under construction at the end of the East Siberia-Pacific Ocean pipeline was planned to have a refining depth of 93%, which is similar to that of most U.S. refineries (Vostochnyi nefteprovod, 2010).

Outlook

Russia has large reserves of a variety of mineral resources and undoubtedly will continue to be one of the world's leading mineral producers. Although the country's economy is expected to grow in 2011, some problems are likely to remain. In 2010, the Russian economy returned to economic growth after the significant decline in 2009. According to some analysts, however, the recovery of 2010 did not appear sufficiently vigorous to carry the country's strong economic growth into the next decade (Vinogradov, 2010). Even in the sectors of the economy where the country is among the world leaders (ferrous metals, gas, petroleum), Russian industry has obsolete plants and equipment, a slow rate of innovation, and low labor productivity. In some subsectors of the mineral industry, exploration is lagging behind production, which signals insufficient expenditures on prospecting and exploration activities. After the demise of the Soviet Union in 1991, some minerals that were not mined on Russian territory (such as manganese) stopped being produced, and Russia had to rely on imports from its neighbors or experience broken production chains. In the years to come, Russia will likely need to invest more into domestic exploration activities and (or) establish better business relations with neighboring countries. Although the Customs Union with Belarus and Kazakhstan, which went into force in 2010, is a step in the second direction, it remains to be seen whether Russia will be able to maintain and strengthen its leading positions in mineral production in the next decade (Evraziyskaya economicheskaya komissiya, 2012).

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TABLE 1

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Ore and concentrate:						
Alumina	thousand metric tons	3,265	3,333	3,112	2,794	2,857
Bauxite		6,300,000	5,775,000	5,675,000	5,775,000	5,475,000
Nepheline concentrate, 25% to 30%		5,140,000 r	4,880,000 r	4,760,000 r	4,400,000 r	4,900,000
Metal, smelter, primary		3,717,907	3,955,417	4,190,000	3,815,000	3,947,000
Antimony, mine output, recoverable Sb content[e]		3,500	3,500	3,500	3,500	3,000
Arsenic, white[e]		1,800	1,500	1,500	1,500	1,500
Bismuth:[e]						
Mine output, Bi content		55	55	70	65	50
Metal, refined		11	12	13	12	10
Cadmium, metal, smelter		690	810	800	700	NA
Chromium, chrome ore, marketable		966,065	776,681	913,000	416,194	400,000 e
Cobalt:[e]						
Mine output, recoverable Co content		6,300	6,300	6,200	6,100	6,200
Metal, refined		5,000	3,800	2,500	2,352 [3]	2,460
Copper:						
Ore, recoverable Cu content[e]		725,000	740,000	750,000	676,000 r	703,000
Metal:						
Blister, smelter:[e]						
Primary		635,000	650,000	630,000	580,000 r	590,000
Secondary		312,000	290,000	235,000	220,000 r	240,000
Total		947,000	940,000	865,000	800,000 r	830,000
Refined:						
Primary		635,000	650,000	610,000	612,000 r	656,000
Secondary		312,000	289,000	250,000	250,000 r	218,000
Total		947,000	939,000	860,000	862,000 r	874,000
Gallium[e]		11	11	11	11	11
Gold:						
Mine output, Au content	kilograms	159,340	156,975	172,031	192,832 r	189,000
Secondary recovery	do.	4,981	5,867	8,140	12,404 r	12,600
Indium[e]		10	10	10	4	NA
Iron and steel:						
Iron ore:						
Gross weight		102,000,000	105,000,000	99,900,000	92,000,000	95,500,000
Fe content, 55% to 63%[e]		59,100,000	60,800,000	57,800,000	53,200,000	58,500,000
Metal:						
Pig iron		51,683,000	51,523,000	48,300,000	43,930,000	48,200,000 e
Direct-reduced iron[e]		3,280,000 r	3,410,000 r	4,560,000 r	4,670,000 r	4,700,000
Ferroalloys:[e]						
Blast furnace:						
Ferromanganese		130,000	120,000	110,000	88,000 r	171,600 [3]
Ferrophosphorus		3,500	3,500	3,500	3,000	3,600
Spiegeleisen		7,000	7,000	7,000	6,500	5,500
Electric furnace:						
Ferrochromium		600,000	570,000	490,000	378,000 [3]	414,288 [3]
Ferrochromiumsilicon		4,000	4,000	4,000	3,500	4,200
Ferronickel, gross weight:[3, 4]						
High-nickel		16,085 r	19,031 r	17,971 r	17,489 r	19,763
Other		12,340 r	12,840 r	13,440 r	14,040 r	13,165
Ferroniobium (ferrocolumbium)		--	121	121	120	121

See footnotes at end of table.

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TABLE 1—Continued

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS—Continued						
Iron and steel—Continued:						
Metal—Continued:						
Ferroalloys—Continued:[e]						
Electric furnace—Continued:						
Ferrosilicon		882,300 [3]	896,100 [3]	850,000	745,000	916,000
Ferrovanadium		11,000	12,000	12,000	8,029 [r, 3]	13,507 [3]
Silicomanganese		40,000	40,000	40,000	98,700	147,900 [3]
Silicon metal		54,500	54,000	54,000	23,900 [r]	48,700
Other		22,000	22,000	22,000	20,000	18,000
Total, ferroalloys		1,780,000	1,760,000	1,620,000 [r]	1,410,000 [r]	1,780,000
Steel:						
Crude		70,816,000	72,389,000 [r]	68,700,000 [r]	59,166,000	66,300,000
Finished, rolled		58,200,000	59,660,000	56,564,000	50,846,000	57,800,000
Pipe		7,898,400	8,706,000	7,772,000	6,655,000	9,149,000
Lead:[e]						
Mine output, recoverable Pb content		36,000 [r]	50,000	60,000	70,000	97,000
Metal, refined, primary and secondary		78,000	94,000	80,000	73,000	89,000
Magnesium:[e]						
Magnesite		1,200,000	1,200,000	1,200,000	1,000,000	1,200,000
Metal, including secondary		35,000	37,000	37,000	37,000	37,000
Manganese ore:[e]						
Gross weight		12,000	44,000	45,000	45,000	45,000
Mn content		2,400	9,000	9,200	9,200	9,200
Mercury[e]		50	50	50	50	50
Molybdenum, in concentrate[e]		3,100	3,300	3,600	3,800	3,800
Nickel:						
Marketable mine production, Ni content:						
Laterite ore		37,758 [r]	45,687 [r]	36,804 [r]	32,298 [r]	41,184
Sulfide concentrate		239,231	234,083	229,765 [r]	229,493	228,093
Total		276,989 [r]	279,770 [r]	266,569 [r]	261,791 [r]	269,277
Matte, for export, primarily to China		1,972 [r]	919 [r]	-- [r]	-- [r]	660
Nickel products:						
Ferronickel:						
High-nickel		14,436	17,111	16,158	15,565	16,799
Other		12,340 [r]	12,840 [r]	13,440 [r]	14,040 [r]	14,600
Metal		255,045	248,363	242,409	237,270	243,676
Oxide sinter		2,713	235	--	--	--
Chemicals		3,500	3,100	2,900	2,700	2,900
Total		288,034 [r]	281,649 [r]	274,907 [r]	269,575 [r]	277,975
Niobium (columbium)		NA	NA	NA	NA	NA
Platinum-group metals:[e]						
Platinum	kilograms	29,000	27,000	25,000 [r]	24,500 [r]	25,000
Palladium	do.	98,400	96,800	87,700	83,200 [3]	84,700
Other	do.	15,600	14,500	12,500	11,900	12,000
Total	do.	143,000	138,000	125,000 [r]	120,000 [r]	122,000
Rhenium[e]	do.	1,400	1,500	1,500	1,500	1,500
Selenium[e]	do.	110,000	120,000	130,000	140,000	140,000
Silicon[e]		600,000	635,000	640,000	640,000	650,000
Silver:						
Mine output, Ag content	kilograms	973,539 [r]	911,332 [r]	1,132,166 [r]	1,312,567 [r]	1,356,000
Secondary recovery	do.	265	265	265	228 [r]	197

See footnotes at end of table.

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TABLE 1—Continued

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS—Continued						
Tin:[e]						
Mine output, recoverable Sn content		3,000	2,500	1,500	1,200	160
Metal, smelter:						
Primary		4,980	3,800	2,000	1,700 [r]	100
Secondary		500	400	300	300	300
Total		5,480	4,200	2,300	2,000 [r]	400
Titanium sponge		32,170	34,150	34,950	26,600	18,621
Tungsten, concentrate, W content[e]		2,800	3,400 [r]	3,000	2,300 [r]	2,800
Vanadium, metal[e]		15,100	14,500	14,500	14,500	15,000
Zinc:[e]						
Mine output, recoverable Zn content		190,000	185,000	204,000	225,000	269,000
Metal, smelter, primary and secondary		240,000	260,000	260,000	225,000	260,000
Zirconium, baddeleyite concentrate, averaging 98% ZrO_2		7,500 [e]	7,136	7,000	5,000	6,000 [e]
INDUSTRIAL MINERALS						
Asbestos, grades I-VI[e]		925,000	1,025,000 [3]	1,017,000 [3]	1,000,000	1,000,000
Barite[e]		63,000	63,000	63,000	63,000	60,000
Boron[e]	thousand metric tons	400	400	400	400	400
Cement, hydraulic		54,731,000 [r]	59,939,000 [r]	53,548,000 [r]	44,266,000 [r]	50,400,000
Clays:						
Bentonite		NA	NA	NA	NA	NA
Kaolin concentrate[e]		45,000	45,000	45,000	45,000	45,000
Diamond:[e]						
Gem	carats	23,400,000	23,300,000	21,925,000 [3]	17,791,400 [3]	17,800,000
Industrial	do.	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000
Synthetic	do.	80,000,000	80,000,000	80,000,000	80,000,000	80,000,000
Total	do.	118,000,000	118,000,000	117,000,000	113,000,000	113,000,000
Feldspar[e]		45,000	45,000	45,000	45,000	45,000
Fluorspar, concentrate, 55% to 96.4% CaF_2[e]		210,000	180,000	269,000	240,000	250,000
Germanium		2	2	2 [e]	2 [e]	2 [e]
Graphite		14,000	14,000	14,000	14,000	14,000
Gypsum[e]		2,600,000	3,000,000	3,600,000	2,900,000 [3]	2,900,000
Iodine[e]		300,000	300,000	300,000	300,000	300,000
Lime, industrial and construction[e]		8,200,000	8,200,000	8,200,000	7,000,000	8,000,000
Limestone		6,930,000	6,910,000	7,420,000	NA	NA
Mica[e]		100,000	100,000	100,000	100,000	100,000
Nitrogen, N content of ammonia		10,500,000	10,500,000 [e]	10,425,000	10,441,000	10,400,000
Perlite		NA	NA	NA	NA	NA
Phosphate rock:[e]						
Gross weight		11,000,000 [r]	11,400,000	10,400,000	9,500,000 [r]	11,000,000
P_2O_5 content		4,000,000 [r]	4,200,000 [r]	3,800,000 [r]	3,500,000 [r]	4,000,000
Potash, marketable, K_2O equivalent		5,742,000 [r]	6,429,000 [r]	5,992,400 [r]	3,727,000	6,283,000
Salt, all types		2,800,000	2,200,000	2,200,000 [e]	2,200,000 [e]	2,200,000 [e]
Soda ash[e]		2,800,000	2,900,000	2,800,000	2,300,000	2,400,000
Sulfur:[e]						
Native		50,000	50,000	50,000	50,000	50,000
Pyrites		304,000	200,000	200,000	200,000	200,000
Byproduct:						
Metallurgy		695,000	800,000	820,000	820,000	820,000
Natural gas		6,346,000 [3]	6,000,000	6,100,000	6,000,000	6,000,000
Total		7,400,000	7,050,000	7,170,000	7,070,000	7,070,000

See footnotes at end of table.

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TABLE 1—Continued

RUSSIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Sulfur, sulfuric acid		9,500,000 [e]	9,689,000	9,106,000	8,600,000 [r]	10,200,000
Talc[e]		160,000	170,000	160,000	160,000	160,000
Vermiculite[e]		25,000	25,000	25,000	25,000	25,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Anthracite	thousand metric tons	8,290	8,662	6,383	7,100 [r]	8,700
Bituminous	do.	202,128	209,216	216,049	200,982 [r]	240,750
Lignite	do.	74,148	71,143	82,485 [r]	69,011 [r]	76,600
Total	do.	284,566	289,021	304,917 [r]	277,093 [r]	326,050
Coke, metallurgical, 6% moisture content	do.	30,701	32,254 [r]	32,082 [r]	24,200 [r]	26,800
Natural gas, marketed	million cubic meters	656,016	653,000	663,000	583,610	651,000
Oil shale[e]		1,200,000	1,200,000	1,200,000	1,200,000	1,200,000
Peat, horticultural and fuel uses[e]		1,300,000	1,300,000	1,300,000	1,300,000	1,300,000
Petroleum:						
Crude:						
In gravimetric units		480,484,000	491,000,000	488,105,000	479,000,000	486,000,000
In volumetric units[e]	thousand 42-gallon barrels	3,490,000	3,570,000	3,550,000	3,590,000	3,530,000
Refinery products:						
In gravimetric units		219,575,000	229,000,000	237,000,000	237,000,000	250,000,000
In volumetric units[e]	thousand 42-gallon barrels	1,770,000	1,840,000	1,910,000	1,910,000	2,010,000
Uranium:						
U content		3,400 [r]	3,413	3,521	3,564	3,562
U_3O_8 content		4,009 [r]	3,762	4,152	4,203	4,200

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available. -- Zero.

[1]In addition to the commodities listed, Russia produces a number of other mineral commodities, which include rare-earth metal concentrates, tantalum, and tellurium, but available information is inadequate to make estimates of output.

[2]Table includes data available through March 13, 2012.

[3]Reported figure.

[4]Excludes nickel-chromium remelt alloy produced from scrap. The remelt alloy typically has a nickel content of 20% to 50%.

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TABLE 2

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Alumina	Achinsk (United Company RUSAL)	Achinsk in East Siberia	900,000
Do.	Bogoslovsk (United Company RUSAL)	Krasnotur'insk	1,050,000
Do.	Boksitogorsk (United Company RUSAL)	Leningradskaya Oblast'	200,000
Do.	Pikalyovo (United Company RUSAL)	Pikalyovo	300,000
Do.	Uralsk (United Company RUSAL)	Kamensk-Uralskiy	700,000
Aluminum, primary smelters	Bogoslovsk (United Company RUSAL)	Krasnotur'insk	175,000
Do.	Bratsk (United Company RUSAL)	Bratsk	950,000
Do.	Irkutsk (United Company RUSAL)	Irkutskaya Oblast'	300,000
Do.	Kandalaksha (United Company RUSAL)	Kola Peninsula	75,000
Do.	Khakas (United Company RUSAL)	Khakassiya	300,000
Do.	Krasnoyarsk (United Company RUSAL)	Krasnoyarskiy Kray	875,000
Do.	Nadvoitsy (United Company RUSAL)	Nadvoitsy, Kareliya Republic	75,000
Do.	Novokuznetsk (United Company RUSAL)	Novokuznetsk	300,000
Do.	Sayansk (United Company RUSAL)	Sayanogorsk	425,000
Do.	Uralsk (United Company RUSAL)	Kamensk-Uralskiy	150,000
Do.	Volgograd (United Company RUSAL)	Volgogradskaya Oblast'	175,000
Do.	Volkhov (United Company RUSAL)	Volkhov, east of St. Petersburg	20,000
Amber	Kaliningrad Amber enterprise (Kaliningrad regional authorities and Alrosa Co. Ltd.)	Kaliningrad Oblast'	250
Antimony:			
Sb content of concentrate	Sarylakh deposit	Ust'-Nera region, Sakha (Yakutiya) Republic	6,000 [2]
Do.	Sentachan deposit	Northeastern Sakha (Yakutiya) Republic	NA
Compounds and metals	Ryazsvetmet plant	Ryazanskaya Oblast'	NA
Apatite, concentrate	Khibiny apatite association (OAO Apatit)	Kola Peninsula	15,000,000
Do.	Kovdor iron ore mining association	do.	700,000
Asbestos	Bazenovskoye chrysotile deposit	Sverdlovskaya Oblast'	NA
Do.	Molodeznoye deposit	Zabaykal'sk (Chita) Oblast'	NA
Do.	"Orenburg Minerals" Co., Kiembaevskoye chrysotile deposit	Orenburgskaya Oblast'	500,000
Do.	"Tuvaasbest" plant, Ak-Dovurakskoye chrysotile deposit	Tyva Republic	250,000
Do.	"Uralasbest" mining and clarification plant	Central Ural Mountains	1,100,000
Barite	Salarinskiy mining and beneficiation complex	Kvartsitovaya Sopka deposit	100,000
Bauxite	OAO Sevuralboksitruda (United Company RUSAL)	Severoural'sk region	NA
Do.	South-Urals mining company (United Company RUSAL)	South Ural Mountains	NA
Do.	Severnaya Onega Mine (United Company RUSAL)	Northwest region	800,000
Do.	Komi Aluminum (United Company RUSAL)	Sredne-Timanskiy	3,000,000
Boron, boric acid	Bor Association	Primorskiy Kray	140,000
Do.	Amur River complex	Far East	8,000
Do.	Alga River chemical complex	do.	12,000
Chromite	Saranov complex	Saranovskiy	200,000
Coal	Donets (east) Basin	Rostovskaya Oblast'	30,000,000
Do.	Kansk Achinsk Basin	East Siberia	50,000,000
Do. thousand metric tons	Kuznetsk Basin (Kuzbass)	West Siberia	160,000
Do.	Moscow Basin	Moscow region	15,000,000
Do.	Neryungri Basin	Sakha (Yakutiya) Republic	15,000,000
Do.	Pechora Basin	Komi (Syktyvkar) Republic	30,000,000
Do.	South Yakutiya Basin	Sakha (Yakutiya) Republic	17,000,000
Cobalt	OJSC MMC Norilsk Nickel	Noril'sk, Kola Peninsula	4,000
Do.	Rezh and Yuzhuralnikel enterprises	South Ural Mountains	2,100

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Cobalt—Continued		Ufaleynikel Co.	Chelyabinskaya Oblast', Ural Mountains	4,000
Do.		Khovu-Aksynskoe (nickel-cobalt) deposit	Khovu-Aksy, Tyva Republic	NA
Copper:				
Cu in concentrate		OJSC MMC Norilsk Nickel	Noril'sk region, Kola Peninsula	500,000
Do.		ZAO Russian Copper Co. (RMK)	Urals	70,000
Do.		Metalloinvest Holding	Udokan, Zabaykal'skiy Kray	NA
Do.		Ural Mining and Metallurgical Co. (UMMC)	do.	230,000
Metal, refined		OJSC MMC Norilsk Nickel	Noril'sk region, Kola Peninsula	450,000
Do.		ZAO Russian Copper Co. (RMK)	Urals	170,000
Do.		Ural Mining and Metallurgical Co. (UMMC)	do.	360,000
Diamond, gem and industrial	thousand carats	Almazy Rossii-Sakha Joint Stock Co. (Alrosa Co. Ltd.) enterprises:	Sakha (Yakutiya) Republic mines:	
		Udachnyy mining and beneficiation complex	Zarnitsa and Udachnyy	NA
Do.	do.	Mirny mining and beneficiation complex	Mir and International	NA
Do.	do.	Aikhal mining and beneficiation complex	Aikhal and Komsomol'skiy	NA
Do.	do.	Anabaraskiy mining and beneficiation complex	Alluvial mines	NA
Do.	do.	Nyurbinskiy mining and beneficiation complex	Nyurbinskiy and Botuobinskiy	NA
Do.	do.	Lomonosov	Arkhangel'skaya Oblast'	NA
Feldspar		Kheto-Lanbino and Lupikko deposits	Kareliya Republic	NA
Ferroalloys		ChEMK Industrial Group enterprises:		
Do.		Chelyabinsk electrometallurgical plant	Chelyabinskaya Oblast'	450,000
Do.		Kuznetsk ferroalloys plant	Novokuznetsk	400,000
Do.		Chusovoy iron and steel plant	Perm' Kray	NA
Do.		Klyuchevsk ferroalloy plant	Dvurechensk	160,000
Do.		Kosaya Gora iron works	Kosaya, Gora	200,000
Do.		Lipetsk iron and steel works	Lipetskaya Oblast'	NA
Do.		Serov ferroalloy plant (a subsidiary of Eurasian Natural Resources PLC [ENRC])	Sverdlovskaya Oblast'	NA
Ferronickel		Ufaleynikel company	Chelyabinskaya Oblast', Urals	5,000
Ferrovanadium		Vanadii-Tulachermet (Evraz Group)	Tula, North Caucasus	NA
Fluorspar		Abagaytuy deposit	Transbaikal	NA
Do.		Usugli Mine	do.	NA
Do.		Kyakhtinsky deposit	do.	NA
Do.		Kalanguy mining complex	Zabaykal'skiy Kray	NA
Do.		Yaroslavsky mining and beneficiation complex	Pogranichnoye and Vosnesenskoye deposits, Russian Far East's Primorskiy Kray	NA
Gallium		Achinsk (United Company RUSAL)	Achinsk in East Siberia	15[2]
Do.		OOO Galliy	NA	NA
Do.		Novosibirsk tin complex	Novosibirsk	NA
Do.		Pikalevo (United Company RUSAL)	Pikalevo	NA
Germanium, metal and products		Federal State Unitary Enterprise Germanium	Kranoyarsk	7
Gold	kilograms	Mining companies:	Mining regions:	
		ZAO Amur a/s	Khabarovskiy Kray	5,500
Do.	do.	OAO Buryatzoloto	Buryatiya Republic	5,000
Do.	do.	ZAO Chukotskaya GGK	Chukotskiy Avtonomnyy Okrug	1,700
Do.	do.	OOO GRK Aldanzoloto	Sakha (Yukutiya) Republic	4,000
Do.	do.	Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	550,000,000
Do.	do.	LT-Resurs, ZAO	Irkutskaya Oblast'	2,700
Do.	do.	OOO Neryungri-Metallik	Sakha (Yakutiya) Republic	1,500
Do.	do.	OOO Nirungan	do.	1,100
Do.	do.	OAO Omchak	Magadanskaya Oblast'	3,000
Do.	do.	OAO Omolonskaya ZRK	do.	5,000
Do.	do.	ZAO Omsukchanskaya GGK	do.	3,000

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Gold—Continued		Mining companies—Continued:	Mining regions—Continued:	
Do.	kilograms	Oyna, a/s	Tyva Republic	1,500
Do.	do.	Petropavlovsk plc	Petropavlovsk	NA
Do.	do.	OAO Pokrovskiy Mine	Amurskaya Oblast'	6,000
Do.	do.	OAO Polimetal	Magadanskaya and Sverdlovskaya Oblast's, Khabarovskiy Kray	7,500
Do.	do.	Polyarnaya, a/s	Chukotskiy Avtonomnyy Okrug	1,000
Do.	do.	OAO Polyus Zoloto	Krasnoyarskiy Kray	38,000
Do.	do.	OOO Priisk Drazhnyy,	do.	1,200
Do.	do.	OAO Priisk Solov'yevskiy	Amurskaya Oblast'	1,500
Do.	do.	OOO Ros-DV	Khabarovskiy Kray	1,100
Do.	do.	OOO Russdragmet	Khabarovskiy Kray, Zabaykal'skiy Kray	6,000
Do.	do.	Seligdar, a/s	Sakha (Yakutiya) Republic	2,000
Do.	do.	Severstal Nordgold NV	Russia, Kazakhstan, and West Africa	NA
Do.	do.	OOO Sovrudnik	Krasnoyarskiy Kray	2,000
Do.	do.	OAO Susumanzoloto	Magadanskaya Oblast'	3,000
Do.	do.	Seligdar, a/s	Sakha (Yakutiya) Republic	2,000
Do.	do.	OAO Susumanzoloto	Magadanskaya Oblast'	3,000
Do.	do.	OAO Uralelktomed'	Sverdlovskaya Oblast'	1,400
Do.	do.	Vitim, a/s	Irkutskaya Oblast'	2,900
Do.	do.	Votok, a/s	Khabarovskiy Kray	1,100
Do.	do.	Yuzhuralzoloto	Chelyabinskaya Oblast'	4,200
Do.	do.	Zapadnaya, a/s	Krasnoyarskiy Kray	1,900
Do.	do.	ZAO Zolotaya, ZDK	Khakasiya Republic	1,200
Indium:				
Primary		Chelyabinsk zinc plant	Chelyabinskaya Oblast'	6
Secondary		Elektrotsink plant	Vladikavkaz	6
Iron ore		Kursk Magnetic Anomaly (KMA) region, which contains the following enterprises:	Locations:	50,000,000 [2]
		Lebedi and Stoilo	Gubkin	
		Mikhaylovka	Zheleznogorsk	
Do.		Northwest region, which contains the following enterprises:	Locations:	22,000,000 [2]
		Kostomuksha	Kostomuksha	
		Kovdor	Kola Peninsula	
		Olenegorsk	Olenegorsk	
Do.		Siberia region, which contains the following enterprises:	Locations:	18,000,000 [2]
		East:		
		Korshunovo	Zheleznogorsk	
		Rudnogorsk	Rudnogorsk	
		West:		
		Abakan	Abaza	
		Sheregesh	Sheregesh	
		Tashtagol	Tashtagol	
		Teya	Vershina Tei	
Do.		Ural Mountains region, which contains the following enterprises:	Locations:	22,000,000 [2]
		Akkermanovka	Novotroitsk	
		Bakal	Bakal	
		Goroblagodat	Kushva	
		Kachkanar	Kachkanar	
		Magnitogorsk	Magnitogorsk	
		Peshchanka	Rudnichnyy	

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Lead, metal		Dalpolymetal lead smelter	Rudnaya in Primorskiy Kray	20,000
Do.		Elektrozinc lead smelter [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz in North Caucasus	40,000
Lead-zinc, recoverable content of ore:				
Lead, recoverable Pb content of ore		Altay mining-beneficiation complex	Altay Kray, South Siberia	2,000
Do.		Dalpolymetal mining-beneficiation complex	Primorskiy Kray	20,000
Do.		Nerchinsk polymetallic complex	Zabaykal'skiy Kray	7,000
Do.		Sadon lead-zinc complex	North Ossetia	5,000
Do.		Salair mining-beneficiation complex	Kemerovskaya Oblast'	2,000
Zinc, recoverable Zn content of ore		Altay mining-beneficiation complex	Altay Kray, South Siberia	1,000
Do.		Dalpolymetal mining-beneficiation complex	Primorskiy Kray	25,000
Do.		Nerchinsk polymetallic complex	Zabaykal'skiy Kray	12,500
Do.		Sadon lead-zinc complex	Severnaya Osetiya	14,000
Do.		Salair mining-beneficiation complex	KemerovskayaOblast'	10,500
Limestone		Mazulsky Mine (United Company Rusal)	Goryachegorsk massif, east Siberia	NA
Lithium and its compounds		JSC Novosibirsk Chemcal Plant (TVEL Corp.)	Novosibirsk	NA
Do.		JSC Chemical-Metallurgical Plant (TVEL Corp.)	Krasnoyarsk	NA
Magnesite		Karagayskiy open pit (Magnezit Group) and Magnezitovaya underground mine (Magnezit Group)	Sakha group of deposits (Chelyabinskaya Oblast')	3,800,000 [2]
Magnesium, metal (for sale)		Avisma plant	Berezniki	35,000
Do.		Solikamsk plant (Uralkaliy)	Permskiy Kray	30,000
Mica		Emel'dzhak deposit, Aldan Shield	Sakha (Yakutiya) Republic	NA
Do.		Lopatova Guba mica pit, Northern Kareliya	Kareliya Republic	NA
Do.		Kovdor phlogopite Mine (Mica Mine; Slyuda Mine; Kovdorslyuda Shaft)	Kola Peninsula, Murmanskaya Oblast'	NA
Do.		Irkutsk complex (JSC "Vostoksluda")	Mam deposit, Irkutskaya Oblast'	NA
Molybdenum		Dzhida tungsten-molybdenum Mine	West Transbaikal	NA
Do.		Sorsk molybdenum mining enterprise	Khakasiya Republic	NA
Do.		Tyrnyauz tungsten-molybdenum Mine	North Caucasus	NA
Do.		Shakhtaminskoye molybdenum mining enterprise	Zabaykal'skiy Kray	NA
Natural gas	million cubic meters	Komi Republic	Komi Republic	8,000
Do.	do.	Noril'sk area	Noril'sk region and Kola Peninsula	5,500
Do.	do.	North Caucasus	North Caucasus	6,000
Do.	do.	Sakhalin	Far East	2,000
Do.	do.	Tomsk Oblast	West Siberia	500
Do.	do.	Tyumen Oblast, including:	do.	575,000 [2]
Do.	do.	Medvezhye field	do.	(75,000)
Do.	do.	Urengoy field	do.	(300,000)
Do.	do.	Vyrngapur field	do.	(17,000)
Do.	do.	Yamburg field	do.	(170,000)
Do.	do.	Bovanenko field	Yamal Peninsula	NA
Do.	do.	Pestsovoyy field	Ob-Taz Gulf area	NA
Do.	do.	Zapolyarnyy field	do.	NA
Do.	do.	Schtokmanov field	Barents Sea	NA
Do.	do.	Urals	Ural'skiye Gory	45,000
Do.	do.	Volga	Vologodskaya Oblast'	6,000
Do.	do.	Yakut-Sakha	Sakha (Yakutiya) Republic	1,500
Nepheline syenite		Apatite complex	Kola Peninsula	1,500,000
Do.		Kiya-Shaltyr Mine (United Company RUSAL)	Goryachegorsk massif, east Siberia	NA
Nickel:				
Ni in ore		OJSC MMC Norilsk Nickel	Kola Peninsula and Noril'sk region	300,000
Do.		OAO Ufaleynikel [Koks Company of Industrial Metallurgical Holding]	Chelyabinskaya Oblast', Urals	17,000
Do.		OAO Yuzhuralnikel [Mechel OAO]	South Urals	3,000

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Nickel—Continued:			
Metal:			
Smelting	OJSC MMC Norilsk Nickel	Noril'sk region, Kola Peninsula	160,000
Do.	do.	Pechenga	50,000
Do.	do.	Monchegorsk	50,000
Refining	do.	do.	140,000
Do.	do.	Noril'sk region, Kola Peninsula	100,000
Ni products and Ni in FeNi	Enterprises	Location:	
	Rezh [Ural Mining and Metallurgical Co. (UMMC)]	South Urals	65,000 [2]
	Ufaleynikel [Koks company of Industrial Metallurgical Holding]	do.	
	Yuzhuralnikel [Mechel OAO]	do.	
Niobium (columbium)	Karnasurt mining enterprise (AO Sevredmet)	Lovozerskoye deposit, Kola Peninsula	12,000
Oil shale	Leningradslanets Association	Slantsy, Leningradskaya Oblast'	5,000,000
Petroleum	Bashneft'	Bashkortostan Republic	12,000,000
Do.	Gazprom Neft'	Deposits throughout Russia	50,000,000
Do.	OAO Lukoil	West Siberian deposits:	100,000,000 [2]
		Kechimovskoye	
		Nivagalskoye	
		Urals deposits	
		Volga deposits	
		Timen Pechora deposit:	
		Yuzhnaya Khylchuya	
		Komi Republic deposits:	
		Kyrtayelskoye	
		Pashshorskoye	
		Perevoznoye	
Do.	OAO Novatek	West Siberia	5,000,000
Do.	OAO Rosneft'	Deposits throughout Russia	120,000,000
Do.	Russneft'	Central and West Siberia, Ural Mountains and Volga regions	15,000,000
Do.	Slavneft'	West Siberia and Krasnoyarskiy Kray	20,000,000
Do.	Surgutneftegas	NA	60,000,000
Do.	Tatneft'	Deposits	30,000,000 [2]
		Romashkinskoye	
		Novo-Elkkhovskoye	
		Bavlinskoye	
		Bondyuzskoye	
		Pervomayskoye	
		Sabandchinskoye	
Do.	TNK-BP	Deposits	75,000,000 [2]
		Kamennoye	
		Kovyatka	
		Russkoye	
		Suzunskoye	
		Tagulskoye	
		Uvat	
		Verkhnechonsk	
Phosphate rock	Kingisepp complex (OAO Fosforit)	Leningradskaya Oblast'	3,500,000
Do.	Lopatino and Yegorevsk deposits	Moscow Oblast'	NA
Do.	Polpinskoye deposit	Bryanskaya Oblast'	NA
Do.	Verkhnekamsk deposit	Ural'skiye Gory	NA
Phosphate rock, apatite concentrate	OAO Apatit	Kola Peninsula	12,000,000
Do.	Kovdor iron mining complex	do.	700,000

See footnotes at end of table.

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TABLE 2—Continued
RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Platinum-group metals:			
Ore, PGM content	OJSC MMC Norilsk Nickel	Noril'sk region, Kola Peninsula	150
Do.	AO Koryakgeoldobycha, Amur Prospectors	Placer deposits (mostly platinum), Urals; Siberia; Russian Far East	10
Metals	Krasnoyarsk Nonferrous Metals Plant (Krastsvetmet)	Krasnoyarskiy Kray	NA
Do.	Ekaterinburgskiy plant (EZOTsM)	Sverdlovskaya Oblast'	NA
Do.	Priobsk plant (OJSC Gazprom Neft)	Khanty-Mansiyskiy Avtonomnyy Okrug	NA
Potash, K_2O equivalent	Uralkaliy	Verkhnekamsk deposit	3,000,000
Do.	OAO Silvinit	Solikamsk-Berezniki regions, Ural'skiye Gory	2,000,000
Rare earths	Lovozerskoye deposit	Kola Peninsula	NA
Salt	AO Bassol'	Lake Baskunchak in Astrakhanskaya Oblast'	2,500,000
Do.	Dus-Dagskoe deposit	Dus-Dag Mountains	25,000
Silver	Dukat Mine	Magadanskaya Oblast'	1,000
Do.	Kinross Gold Corp.	Chukotskiy Avtonomnyy Okrug	550,000,000
Soda ash	Achinsk plant	East Siberia	595
Do.	Berezniki plant	Ural'skiye Gory	1,080
Do.	Pikalevo plant	Leningradskaya Oblast'	200
Do.	Sterlitamak plant	Bashkortostan Republic	2,135
Do.	Volkhov plant	Leningradskaya Oblast'	20
Steel, crude	OAO Amurmetal	Komsomol'sk-na-Amure	1,600,000
Do.	JSC Asha Metallurgical Plant	Chelyabinskaya Oblast'	450,000
Do.	Beloretsk Iron and Steel Works	Bashkirskoye	380,000
Do.	Chusovskoy Iron and Steel Works	Perm' Kray	570,000
Do.	JSC Electrostal Metallurgical Plant	Moscow	314,000
Do.	Gorkovskoy Metallurgichesky Zavod	Nizhegorodskaya Oblast'	78,000
Do.	Gur'yevsk Steel Works	Kemerovskaya Oblast'	160,000
Do.	Karaganda	Karagandinskaya Oblast'	6,300,000
Do.	Kuznetsk Steel Works	Kemerovskaya Oblast'	4,700,000
Do.	Lys'va Metallurgical Plant	Permskaya Oblast'	350,000
Do.	OAO Magnitogorsk mining and metallurgical complex (MMK)	Chelyabinskaya Oblast'	16,200,000
Do.	OAO Mechel (Mechel)	do.	7,000,000
Do.	Nizhniy Sergi Steel Works	Sverdlovskaya Oblast'	300,000
Do.	Nizhniy Tagil mining and metallurgical complex (NTMK) (Evraz Group)	do.	8,000,000
Do.	Nosta JSC (JSC Orsk-Kahlilovo Iron and Steel Works)	Novotroitsk, Orenburgskaya Oblast'	4,600,000
Do.	Novolipetskiy mining and metallurgical complex (NLMK)	Lipetskaya Oblast'	9,900,000
Do.	Novosibirsk Steel Works (Novosibprokat)	Novosibirskaya Oblast'	1,100,000
Do.	CJSC Omutninsk Metallurgical Plant	Kirovskaya Oblast'	210,000
Do.	Oskol Electric Steel Works (OEMK)	Staryi Oskol	2,500,000
Do.	Petrovsk-Zabaykal'skiy Steel Works	Petrovsk-Zabaykal'skiy	426,000
Do.	Revdinskiy Steel and Wire Production Works	Sverdlovskaya Oblast'	281,000
Do.	Salda Steel Works	do.	1,900
Do.	Serov Steel Works	do.	1,000,000
Do.	Serp i Molot (Moscow Metallurgical Works)	Moskovskaya Oblast'	70,000
Do.	Severskiy Tube Works	Polevskoy, Sverdlovskaya Oblast'	825,000
Do.	OAO Severstal	Vologodskaya Oblast'	14,000,000
Do.	Sibelektrostal Metallurgical Works	Krasnoyarskiy Kray	110,000
Do.	Sulinskiy Steel Works (Staks)	Rostovskaya Oblast'	280,000

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Steel, crude—Continued:	Taganrog Iron and Steel Works (Tagmet)	Rostovskaya Oblast'	925,000
Do.	OAO Tulachermet	Tul'skaya Oblast'	18,400
Do.	Viz-Stal (Verkh-Isetsk Steel Works)	Sverdlovskaya Oblast'	132,000
Do.	Volgograd Steel Works (Red October)	Volgogradskaya Oblast'	2,000,000
Do.	Vyksa Steel Works	Nizhegorodskaya Oblast'	540,000
Do.	Zapadno-Sibirskiy mining and metallurgical complex (ZSMK) (Evraz Group)	Kemerovskaya Oblast'	6,900,000
Do.	Zlatoust Iron and Steel Works	Zlatoust, Chelyabinskaya Oblast'	1,200,000
Talc	Onotsk deposit	Irkutskaya Oblast'	NA
Do.	Kirgiteysk deposit	Krasnoyarskiy Kray	NA
Do.	Miass deposit	Chelyabinskaya Oblast'	NA
Do.	Shabrovsk deposit	Sverdlovskaya Oblast'	NA
Tantalum, ore	Facilities: Zabaykalskiy mining and beneficiation complex NA	Deposits: Etykinskoye deposit Lovozerskoye deposit, Kola Peninsula	10 [2]
Tellurium	OJSC MMC Norilsk Nickel	NA	5
Do.	Ural Mining and Metallurgical Co. (UMMC)	Urals	35
Tin:	Novosibirsk mining and beneficiation complexes:	Locations:	
Ore	Khinganskoye olovo (Jewish Autonomous District)	Khabarovskiy Kray	NA
Do.	Dalolovo	Solnechnyy deposit, Primorskiy Kray	NA
Do.	Deputatskiy (Sakhaolovo)	Sakha (Yakutiya) Republic	NA
Do.	Vostokolovo	Russian Far East	NA
Do.	Iultin mining and beneficiation complex	Magadanskaya Oblast'	NA
Do.	Khrustalnyy mining and beneficiation complex	Primorskiy Kray	NA
Do.	Pevek mining and beneficiation complex	Magadanskaya Oblast'	NA
Metal	Novosibirsk smelter	Novosibirskaya Oblast'	NA
Do.	Podol'sk smelter	Podol'sk	NA
Do.	Ryazan smelter	Ryazanskaya Oblast'	NA
Titanium:			
Metal	Moscow plant	Moscow	NA
Do.	Podol'sk plant	Podol'sk	NA
Do.	Verkhnaya Salda Metallurgical Production Association (VSMPO)-Avisma titanium-magnesium complex	Sverdlovskaya Oblast', Ural Mountains	NA
Sponge	do.	do.	40,000
Tungsten:	Deposits:	Locations:	
W content of concentrates	Aginskoye deposit	Sakha (Yakutiya) Republic	NA
Do.	Antonovogorsk deposit	East Transbaikal, Chita Oblast'	NA
Do.	Balkan deposit	Northeast of Magnitogorsk, Ural'skiye Gory	NA
Do.	Belukha deposit	East Transbaikal, Zabaykal'skiy Kray	NA
Do.	Bom-Grokhom deposit	West Transbaikal	NA
Do.	Dzhida deposit	do.	NA
Do.	Iultin deposit	Magadanskaya Oblast'	NA
Do.	Kti-Teberdaskoye deposit	North Caucasus	NA
Do.	Lermontovo W-Au deposit	Russian Far East	NA
Do.	Primorsky deposit	do.	NA
Do.	Solnechnyy deposit	Southern Khabarovskiy Kray	NA
Do.	Tyrnyauz tungsten-molybdenum mining and processing complex	Kabardino-Balkariya Republic, North Caucasus	NA
Metal, tungsten anhydride	Gidrometallurg plant	Kabardino-Balkariya Republic, North Caucasus	NA

See footnotes at end of table.

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TABLE 2—Continued

RUSSIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Uranium, U content	TVEL Corp. enterprises:	Locations:	3,500
	ZAO Dalur mining enterprise	Kurganskaya Oblast'	
	OAO Khiagda mining enterprise	Buryatiya Republic	
	Priargunsky mining and chemical enterprise	Krasnokamensk, Zabaykal'skiy Kray	
Vanadium:			
Ore	Kachkanar iron mining complex	Ural'skiye Gory	NA
Metal	Chusovoy and Nizhniy Tagil plants	do.	17,000
Pentoxide	Vanadii-Tulachermet	Tul'skaya Oblast', North Caucasus	NA
Zinc:			
Zn content of copper-zinc ore	Bashkir copper-zinc complex	Sibai, southern Ural Mountains	5,000
Do.	Buribai copper-zinc mining complex	Buribai, southern Ural Mountains	1,500
Do.	Gai copper-zinc mining and beneficiation complex	Gai, southern Ural Mountains	25,000
Do.	Kirovgrad copper enterprise	Kirovgrad, central Ural Mountains	1,200
Do.	Sredneuralsk copper complex	Revda, central Ural Mountains	5,000
Do.	Uchali copper-zinc mining and beneficiation complex	Uchalinskiy Rayon, southern Ural	90,000
Metal	Chelyabinsk electrolytic zinc plant	Chelyabinskaya Oblast'	200,000
Do.	Elektrozink plant [Ural Mining and Metallurgical Co. (UMMC)]	Vladikavkaz, North Caucasus	90,000
Do.	Uralelektromed plant [Ural Mining and Metallurgical Co. (UMMC)]	Verkhnaya Pyshma	17,000
Zirconium:			
Baddaleyite concentrate	Kovdor iron ore mining and beneficiation complex	Kola Peninsula	3,500
Metal	Chepetsky metallurgical plant (TVEL Corp.)	Glazov, Udmurt Republic	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

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The Mineral Industry of Serbia

By Mark Brininstool

Serbia remained a modest producer of mineral commodities and its output was not significant in terms of world production. Within the Southern Balkans, the country was an important producer of such metals as copper, iron and steel, and refined petroleum products. On February 18, 2008, the Serbian Province of Kosovo declared its independence. The U.S. Government has recognized Kosovo's independence and, therefore, Kosovo is included as a separate country in the U.S. Geological Survey's Minerals Yearbook. Consequently, this report contains economic and mineral production data only for Serbia.

Minerals in the National Economy

In 2010, Serbia's gross domestic product (GDP) increased by 1.8%. In 2009 (the most recent year for which data were available), mining and quarrying made up about 1.3% of the GDP, and mining of coal and peat made up about 79% of the total value of mining and quarrying. The value of exports of mining and quarrying products in 2009 (the most recent year for which data were available) decreased by about 34% to $42 million and the value of imports of mining and quarrying products decreased by about 45% to about $2 billion compared with that of 2008. The large trade deficit in mining and quarrying was mainly owing to imports of crude petroleum and gas products (including service activities), which were valued at about $1.8 billion in 2009 and $3.1 billion in 2008. In 2009, about 89% of crude petroleum and 98% of natural gas imports were from Russia (Statistical Office of the Republic of Serbia, 2010, p. 122, 295–296, 304; 2011).

Production

Production of silver increased by an estimated 93%; pig iron, by 26%; sand and gravel, by an estimated 21%; and crude steel, by 14%. Production of bituminous coal increased by 57%; natural gas, by 51%; and petroleum refinery products and crude petroleum, by an estimated 32% and 30%, respectively. Production of selenium decreased by 44%; palladium, by 42%; and refined gold, by 21% (table 1).

Structure of the Mineral Industry

Table 2 is a list of Serbia's major mineral industry facilities.

Commodity Review

Metals

Copper.—The Serbian Government remained in control of RTB Bor after unsuccessful attempts to privatize the company in 2007 and 2008 and to find a strategic partner in 2009. In June, RTB Bor signed a $210.7 million deal with SNC-Lavalin Group Inc. of Canada for the construction of a copper smelter and a sulfuric acid plant. The deal was financed by Export Development Canada and the Serbian Government. The new smelter, which was scheduled to be completed in 2013, would have a production capacity of 80,000 metric tons per year of copper anode (SNC-Lavalin Group Inc., 2010; Vasovic, 2010).

Industrial Minerals

Lithium.—Rio Tinto plc reported that its lithium project in Jadar had 125.3 million metric tons (Mt) of inferred resources of ore containing 1.8% lithium oxide and 16.2 Mt of inferred resources of borates. The project was still in the exploration phase of development, but Rio Tinto estimated that the project could begin production within 6 years if it were to be developed (Rio Tinto plc, 2011, p. 53, 88, 91).

Mineral Fuels

Natural Gas and Petroleum.—Serbia was heavily dependent on imports from Russia to meet its demand for crude petroleum and natural gas. In 2009 (the most recent year for which data were available), about $879 million of crude petroleum and about $615 million of natural gas were imported from Russia; the total volume of imports from Russia accounted for about 89% of all crude petroleum and 98% of all natural gas imported into Serbia. In 2009, JSC Gazprom Neft of Russia completed its purchase of a 51% interest in Naftna Industrija Srbije a.d. (NIS), which was Serbia's only producer of natural gas, petroleum, and refined petroleum products. The Serbian Government maintained ownership of the remaining 49% interest. In January 2010, the Serbian Government disbursed part of its shares of NIS to citizens of Serbia and NIS employees, which brought the Government's ownership interest down to 29.9% (JSC Gazprom Neft, 2009; Statistical Office of the Republic of Serbia, 2010, p. 304; Naftna Industrija Srbije a.d., 2011, p. 10)

Outlook

Mineral production in Serbia is expected to remain small by world standards. Output of copper and refined petroleum could increase if planned investments are made in RTB Bor and NIS. Development of lithium deposits could also make Serbia a significant regional producer of this mineral.

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TABLE I
SERBIA: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum ingot, including alloys, secondary		2,031	3,669	1,882	1,789	2,000 e
Copper:						
Mine and concentrator output:						
Ore:						
Gross weight	thousand metric tons	5,775	6,867	7,746 r	9,896 r	10,666 e
Cu content of ore		14,400 e	17,200 e	21,900	24,400	28,400
Concentrate, Cu content e		12,000	16,500	18,800	19,000	19,000
Metal: e						
Blister and anodes:						
Primary		40,000	30,200	31,900	32,000	35,000
Secondary		1,000	1,000	1,000	1,000	1,000
Total		41,000	31,200	32,900	33,000	36,000
Refined: e						
Primary		40,000	30,600	32,800	33,000	34,000
Secondary		1,000	1,000	1,000	1,000	1,000
Total		41,000	31,600	33,800	34,000	35,000
Gold, refined e	kilograms	450 e	500 e	712 r	452 r	356
Iron and steel, metal:						
Pig iron		1,529,177	1,485,000	1,582,000	1,006,000	1,265,000
Crude steel		1,837,000	1,478,000	1,662,000	1,097,000	1,254,000
Semimanufactures		2,379,918	2,431,380	2,393,430	1,556,017	1,600,000 e
Lead:						
Ore:						
Gross weight (Pb-Zn ore)		172,000	198,000	202,000	225,000	225,000 e
Pb content e		1,400	1,600	1,600	1,800	1,800
Metal, including alloys, secondary, refined		2,676	1,273	929	900 e	900 e
Magnesium, metal, secondary e		1,500	2,000	1,500	1,500	1,500
Platinum-group metals: e						
Palladium	kilograms	15	15	70 r	38 r	22
Platinum	do.	2	2	-- r	12 r	--
Selenium	do.	7,500 e	7,500 e	16,827 r	19,075 r	10,592
Silver, mine output, Ag content e	do.	2,200	2,300 r	2,300 r	2,500 r	4,820 3
Zinc:						
Zn content of concentrate e		2,000	1,000	1,000	1,000	1,000
Refined		15,000	--	--	--	--
INDUSTRIAL MINERALS						
Asbestos, ore		4,500	--	--	--	--
Cement	thousand metric tons	2,565	2,677	2,843	2,232	2,130
Gypsum, crude e		45,000	45,000	45,000	45,000	45,000
Lime	thousand metric tons	377	320	292	251	239
Nitrogen, N content of ammonia e		80,000	85,000	47,000	53,000	55,000 e
Salt, all sources		29,847	30,023	30,115	28,783	30,816
Sand and gravel, excluding glass sand e, 4	thousand metric tons	13,700	13,900	13,800	9,200	11,100
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous	thousand metric tons	65	66	66	69	108
Brown coal and lignite	do.	36,720	37,007	38,519	38,828	38,490
Total	do.	36,785	37,073	38,585	38,897	38,598
Natural gas, gross production	million cubic meters	282	274	282	283	427
Petroleum: e, 5						
Crude	thousand 42-gallon barrels	4,850	4,740	4,720	4,920	6,420
Refinery products	do.	19,100	18,900	18,700	16,700	22,000

eEstimated; estimated data are rounded to no more than three significant digits. rRevised. do. Ditto. -- Zero.

[1]Table includes data for Serbia only. No data are included for Kosovo, which declared its independence in February 2008.

[2]Table includes data available through July 27, 2011.

[3]Reported figure.

[4]Data were converted to metric tons from cubic meters.

[5]Data were converted to barrels from thousand metric tons. Data for crude petroleum were reported as follows: 2006—654 (revised); 2007—639; 2008—636; 2009—663; and 2010—865. Data for petroleum products were reported as follows: 2006—2,508; 2007—2,502; 2008—2,462; 2009—2,227; 2010—2,998.

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TABLE 2
SERBIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity holders	Location of main facilities	Annual capacity
Antimony:				
Ores and concentrates		Farmakom M.B.	Mines and mills near Zajaca	NA
Metal		do.	Smelter at Zajaca	NA
Cement		Beocinska Fabrika Cementa (Lafarge S.A., 50%)	Plant at Beocin	2,000
Do.		Holcim (Srbija) a.d. (Holcim Ltd., 100%)	Plant at Popovac	1,400
Do.		Cementara Kosjeric a.d. (Titan Group, 100%)	Plant at Kosjeric	NA
Coal:				
Bituminous		JP PEU Resavica	Ibarski Rudnici Mines near Baljevac and Vrska Cuka Mines	70 e
Brown coal		do.	Underground mines near Resavica, Bogdinac, Bogovina, Krepoljin, and Stavalj	400 e
Lignite		PD RB Kolubara d.o.o. (Electric Power Industry of Serbia)	Opencast mines: Field B, Field D, Veliki Crljeni, and Tamnava West near Vreoci	31,000
Do.		TE-KO Kostolac d.o.o. (Electric Power Industry of Serbia)	Opencast mine Drmno near Kostolac	8,500
Do.		JP PEU Resavica	Underground mine at Lubnica	60 e
Copper:				
Metal		Rudarsko Topionicki Bazen Bor (RTB Bor) (Government owned)	Smelter at Bor	170
Do.		do.	Electrolytic refinery at Bor	170
Mine production, Cu content of concentrate		do.	Mine and mill "Jama" at Bor	8
Do.		do.	Mine and mill at Majdanpek	65
Do.		do.	Mine and mill at Veliki Krivelj	35
Lead-zinc ore:				
Ore		Contango d.o.o.	Mine and mill at Rudnik	250 e
Do.		NA	Grot Mine near Vranje	300 e
Do.		Farmakom M.B.	Mines at Rajiceva Gora, Ravnaja, and Veliki Cip	350 e
Do.		Mineco Group	Mine at Veliki Majdan, near Ljubovija	60 e
Do.		NA	Mill at Kriva Feja	NA
Metal, secondary		Farmakom M.B.	Smelter at Zajaca	NA
Lime		Jelen Do a.d. (Nexe Grupa)	Plant in Jelen Dol, west of Cacak	90
Do.		U.S. Steel Serbia d.o.o.	Plant at Kucevo	NA
Do.		Ravnaja AD	Plant at Mali Zvornik	NA
Magnesite, concentrate		Magnohrom d.o.o.	Mines near Kraljevo	NA
Do.		MG Serbien d.o.o.	Bela Stena, near Baljevac	NA
Magnesium, metal:				
Primary		do.	do.	8,500
Secondary		do.	do.	12,000
Natural gas	million cubic meters	Naftna Industrija Srbije a.d. (NIS) (JSC Gazprom Neft, 51%, and Serbian Government, 29.9%)	Gas is produced from about 60 wells located throughout northern Serbia	430 e
Petroleum:				
Crude	thousand 42-gallon barrels per day	do.	Crude petroleum produced at about 800 wells; the main oilfield is located in northeast Serbia	18 e
Refined		do.	Refinery at Pancevo	4,800
Do.		do.	Refinery at Novi Sad	2,500
Pig iron		U.S. Steel Serbia d.o.o.	Blast furnace at Smederevo	NA
Steel, crude		do.	Plant at Smederevo	2,400
Zinc, metal		Hemijska Industrija Zorka	Electrolytic plant at Sabac	30

eEstimated. Do., do. Ditto. NA Not available

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The Mineral Industry of Slovakia

By Alberto Alexander Perez

Slovakia produced a modest range of mineral products but was not a significant world or regional producer of any minerals. In 2010, Slovakia's real gross domestic product (GDP) increased by 4.5% compared with that of 2009. Services amounted to 61.4% of the GDP, and industrial production, 34.8%. In 2008 (the latest year for which data were available), mining and quarrying made up about 0.52% of the nominal GDP. The country imported 139,200 barrels per day of crude petroleum and 6.4 billion cubic meters of natural gas in 2010. Machinery and electrical equipment made up 35.9% of the exports; the other significant exports were vehicles (21%), base metals (11.3%), and chemicals and minerals (8.1%) (Statistical Office of the Slovak Republic, 2010a, b; U.S. Central Intelligence Agency, 2011).

Production

In 2010, production of mineral commodities generally increased owing to the increased market demand for mineral commodities among Slovakia's main trading partners. In 2010, the country's production of ferrosilicon increased by more than 640%; gold, by 54.3%; copper, by 35.3%; steel, by 22.2%; pig iron, by 20.9%; and primary aluminum, by 8.9% compared with production in 2009. Production for most industrial minerals was estimated, but reported production of cement and dolomite decreased by 4.4% and 1.4%, respectively. Coal production decreased by 7.5% (table 1).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Gold.—In February 2009, Tournigan Energy Ltd. reached an agreement with Ortac Resources plc of the United Kingdom for the sale of its Kremnica gold exploration property. In January 2010, a new purchase agreement was signed that gave Ortac Resources the right to purchase the remaining 80% of shares in the Kremnica project (Tournigan Energy Ltd., 2010, p. 7).

Mineral Fuels

Coal.—The coal industry in Slovakia was undergoing restructuring, which was likely to result in a decrease in production during the next decade. According to estimates by the Ministry of the Economy of the Slovak Republic, production in 2015 would be about 2 million metric tons (Mt); in 2025, 1.5 Mt; and in 2030, 1 Mt. Hornonitranske Bane Prievidza a.s. (HBP) was expected to close the mine at Cigel by 2015; the mine at Handlova was expected to produce about 300,000 metric tons per year (t/yr) until 2020 and was expected to close after that year. The HBP Mine at Novaky was expected to produce 1.2 Mt in 2015 and 2020, 1 Mt in 2025, and 0.5 Mt in 2030; the mine was expected to close after that year. Bana Cary, a.s. was expected to produce about 500,000 t/yr until about 2030 but was expected to continue to operate until 2050. The Bana Dolina, a.s. lignite mine had been expected to close in 2009, but it was reported that it would continue to produce small amounts of lignite through 2011 or 2012 (Ministry of the Economy of the Slovak Republic, 2008, p. 33, 35; Rademaekers and others, 2008, p. 83).

Outlook

No major increases in production are expected in Slovakia in the foreseeable future, and a decreased level of coal production is expected for the next several decades. The country will probably continue to import most of its metallic ores and concentrates and depend on imported mineral fuels for its domestic consumption.

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TABLE I

SLOVAKIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009[e]	2010[e]
METALS						
Aluminum ingot, primary		158,289	160,461	162,995	149,604 [3]	163,000
Copper, smelter, secondary	thousand metric tons	22	20	27	34 [3]	46
Gold, content of concentrate	kilograms	84	92	90 [e]	346 [r]	534
Iron and steel:						
Iron ore:						
Gross weight	do.	583	570	392	-- [r]	--
Metal content[e]	do.	200	190	130	-- [r]	--
Concentrate, gross weight	do.	311	349	182	-- [r]	--
Metal:						
Pig iron	do.	4,145	4,012	3,529	3,019 [3]	3,649 [3]
Ferroalloys:						
Ferrochromium		19	--	--	--	--
Ferromanganese		59,391	74,065	61,194	21,000 [r]	21,000
Ferrosilicomanganese		59,128	71,587	59,940	32,000 [r]	32,000
Ferrosilicon		16,155	8,583	10,844	5,000 [r]	37,034 [3]
Steel, crude	thousand metric tons	5,094	5,089	4,478	3,747 [3]	4,580
Semimanufactures	do.	4,800 [e]	5,069	4,477	3,740	4,567 [3]
INDUSTRIAL MINERALS						
Asbestos		1,000	400	200	200	200
Barite:						
Mine output		57,000	58,000	20,000	30,000 [r]	17,000
Concentrate		16,000	11,000	12,950	8,000 [r]	13,000
Basalt		79,000	69,000	63,000	101,000 [r]	60,000
Cement, hydraulic	thousand metric tons	3,593	3,718	4,157	3,021 [3]	2,888 [3]
Clays:						
Bentonite		136,000	149,000	145,000	109,000 [r,3]	130,521 [3]
Ceramic		58,000	47,000	47,000	47,000	47,000
Kaolin		58,000	46,000	44,000	44,000	44,000
Refractory		--	--	12,000	12,000	12,000
Feldspar		3,000	--	10,000	10,000	10,000
Gypsum and anhydrite, crude		126,000	151,000	152,000	131,000 [r]	87,000
Lime, hydrated and quicklime	thousand metric tons	1,104	1,123	1,082	867 [3]	860
Magnesite, concentrate	do.	941	957	807	800	800
Nitrogen, N content of ammonia[e]		241,383 [3]	260,000	260,000	260,000	260,000
Perlite		16,000	20,000	25,000	25,000	25,000
Salt		99,000	101,000	99,000	38,000 [r]	38,000
Sand and gravel[e]	thousand metric tons	8,000	8,200	9,300	8,500	8,500
Silica sand (foundry and glass sands)	do.	524	591	619	620	620
Stone:						
Dolomite	do.	990	1,057	1,249	908 [3]	895 [3]
Limestone and other calcareous stones for cement	do.	6,611	9,615	4,992	5,099 [3]	4,952 [3]
Quartzite		3,000	1,000	-- [r]	-- [3]	--
Crushed stone[e]	thousand metric tons	15,800	15,000	18,500 [r]	10,571 [r,3]	11,904 [3]
Zeolites		48,000	57,000	87,000	85,000	85,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, brown and lignite	thousand metric tons	2,200	2,111	2,423	2,572 [3]	2,378 [3]
Coke, unspecified		1,857	1,856	1,737	1,573 [3]	1,570
Natural gas	million cubic meters	135	134	111	110	110
Petroleum:[e,4]						
Crude	thousand 42-gallon barrels	200	160	140	140	140
Refinery products	do.	43,700	48,000	47,100	48,100	47,195 [3]

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 11, 2012.

[2]In addition to the commodities listed, a small amount of silver occurs in concentrate produced by gold ore processing on Banska Hodrusa deposit.

[3]Reported figure.

[4]Figures were converted to barrels from production reported in thousand metric tons, which was reported as the following: Crude production: 2006—30; 2007—23; 2008—21; 2009—21 (estimated); and 2010—21 (estimated). Petroleum products: 2006—5,458; 2007—6,006; 2008—5,893; 2009—6,012; and 2010—5,734.

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TABLE 2
SLOVAKIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[1]	Location of main facilities	Annual capacity
Aluminum	Slovalco, a.s. (Norsk Hydro ASA, 55.3%, and ZSNP SCO, a.s., 44.7%)	Ziar nad Hronom, central Slovakia	165
Brown coal and lignite	Hornonitranske Bane Prievidza, a.s. (HBP)	Mines at Cigel, Handlova, and Novaky	2,200
Do.	Bana Dolina, a.s.	Mine east of V'lky Krtis, southern Slovakia	150
Do.	Bana Cary, a.s.	Mine at Cary, western Slovakia	500 e
Cement	Povazska Cementaren, a.s.	Ladce	NA
Do.	Cemmac a.s. (Asamer & Hufnagl Baustoff Holding Wien GmbH, 82.72%)	Horne Srnie	NA
Do.	VSH, a.s. Turna	Turna	1,300
Do.	Holcim (Slovensko), a.s.	Rohoznik	2,200
Coke	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	NA
Copper, smelter, secondary	Kovohuty, a.s. [Montanwerke Brixlegg AG, 100% (A-TEC Industries AG)]	Krompachy, central Slovakia	90
Ferroalloys	OFZ, a.s. (ArcelorMittal)	Istebne	170
Gold in concentrate	Slovenska Banska, s.r.o.	Hodrusa-Hamre	NA
Iron:			
Ore	SIDERIT, s.r.o. Nizna Slana	Nizna Slana, central Slovakia	600 e
Concentrate	do.	do.	400 e
Magnesite	SMZ, a.s. Jelsava	Jelsava, eastern Slovakia	370 e
Do.	Slovmag, a.s. Lubenik (Magnezit Group)	Lubenik, central Slovakia	NA
Do.	GE.NE.S., a.s.	Mutnik, near Hnusta in central Slovakia	NA
Natural gas million cubic meters	NAFTA, a.s.	Oilfields and natural gas fields in western and eastern Slovakia	NA
Do. do.	ENGAS, s.r.o.	Brno	NA
Petroleum:			
Crude	NAFTA, a.s.	Oilfields and natural gas fields in western and eastern Slovakia	NA
Refinery	SLOVNAFT, a.s. (MOL Plc, 98.5%)	Bratislava	6,000
Do.	Petrochema, a.s.	Dubova	150
Pig iron	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	4,500
Salt	Solivary, a.s. Presov	Presov, eastern Slovakia	NA
Steel, crude	U.S. Steel Kosice, s.r.o.	Kosice, eastern Slovakia	4,900
Do.	Zeleziarne Podbrezova, a.s.	Podbrezova	600 e
Zeolites	Zeocem, a.s.	Quarry near Nizny Hrabovec and processing plant near Bystre	NA
Do.	PRO-ZEO, s.r.o.	Humenne	NA

eEstimated. Do., do. Ditto. NA Not available.
[1]Abbreviations for forms of companies include the following: a.s., joint stock company; s r.o., limited company.

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THE MINERAL INDUSTRY OF SLOVENIA

By Mark Brininstool

Slovenia remained a modest producer of mineral commodities in 2010, and its output was not significant on either a world or a regional scale. Slovenia's gross domestic product (GDP) increased by 1.2% in real terms in 2010 compared with that of 2009. In 2009 (the latest year for which data were available), mining and quarrying made up only 0.4% of Slovenia's GDP, and the manufacture of basic metals made up 0.5% (Statistical Office of the Republic of Slovenia, 2011a, b).

Production

In 2010, production of natural gas increased by 159%; secondary aluminum, by an estimated 70%; silica sands, by 56%; crude steel, by 41%; and primary aluminum, by 14%. Production of brown coal decreased by 18% and that of crushed stone, by 14% (table 1). Most mineral commodity production increases seemed to be caused by a return to previous levels of output after production significantly decreased during 2009 owing to the effects of the world financial crisis.

Structure of the Mineral Industry

The Nafta Lendava petroleum refinery was removed from the list of major mineral producers in table 2 because Nafta Lendava produced only nonfuel petrochemicals in 2010 and now appears not to have produced petroleum fuels since 2001. The entry for petroleum refinery products in table 1 has therefore been revised to show no production of refinery products. Table 2 is a list of major mineral industry facilities.

Outlook

Production of minerals and mineral products in Slovenia will likely continue to be modest. As a result, the country is expected to remain dependent on mineral imports, notably mineral fuels. Production of most commodities, notably aluminum and crude steel, will most likely depend mainly on demand from external trade partners.

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TABLE 1

SLOVENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Primary		118,100	111,016	83,328	35,148	40,177
Secondary[e]		20,000	20,000	20,000	10,000	17,000
Iron and steel, metal:						
Ferroalloys, ferrosilicon[e]		12,550 [3]	6,000	--	--	--
Crude steel from electric furnaces		627,000	638,000	642,000	430,000 [r]	606,000
Semimanufactures		678,869	715,539	692,320	462,700	650,000 [e]
Lead, refined, secondary[e]		15,000	15,000	15,000	14,000	14,000
INDUSTRIAL MINERALS						
Cement[e]	thousand metric tons	1,269 [3]	1,300	1,300	1,000	1,000
Clays:[e]						
Bentonite		130	130	130	130	130
Ceramic clay, crude		1,800	1,800	1,800	1,800	1,800
Pumice and related materials, volcanic tuff[e]		40,000	40,000	40,000	40,000	40,000
Salt, all sources[e]		1,624 [3]	2,000	2,000	2,000	2,000
Sand and gravel, excluding glass sand	thousand metric tons	17,873	21,548	19,171	15,720 [r]	16,000 [e]
Silica sands (glass sand, industrial sand)[4]		350,000 [e]	350,000 [e]	353,983	326,636	510,550
Stone, excluding quartz and quartzite, crude:						
Dimension[e]		15,000	15,000	15,000	15,000	15,000
Crushed stone	thousand metric tons	7,547	9,374	9,765	10,144	8,773

See footnotes at end of table.

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TABLE 1—Continued

SLOVENIA: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Brown coal	thousand metric tons	588	483	489	511	419
Lignite	do.	3,934	4,079	4,032	3,918	4,011
Total	do.	4,522	4,562	4,521	4,429	4,430
Natural gas	thousand cubic meters	4,163	3,418	2,610	2,575	6,675
Petroleum:[e]						
Crude[5]	42-gallon barrels	2,110	2,060	1,170	994	990 [e]
Refinery products[6]	do.	-- [r]	-- [r]	-- [r]	-- [r]	--

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through August 23, 2011.

[2]In addition to the commodities listed, common clay and lime also were produced, but available information is inadequate to make reliable estimates of output.

[3]Reported figure.

[4]In previous years, this commodity category was listed as "Quartz, quartzite, glass sand."

[5]Data were converted to barrels from metric tons. Reported data for crude production were as follows: 2006—284; 2007—278; 2008—158; 2009—134; 2010—Not reported.

[6]Slovenia has not produced refined petroleum fuel products since 2001; data reported in the Minerals Yearbook for Slovenia since 2001 were for nonfuel refined petroleum products and, since 2007, for biodiesel.

TABLE 2

SLOVENIA: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum, primary and secondary	Talum d.d. Kidričevo (Elektro Slovenija d.o.o., 80%)	Smelter at Kidricevo	120 [e]
Cement	Salonit Anhovo	Plant at Anhovo	1,100 [e]
Do.	Lafarge Cement d.d. (Lafarge S.A., 56%, and European Bank for Reconstruction and Development, 44%)	Plant at Trbovlje	600
Coal:			
Brown	Rudnik Trbovlje-Hrastnik d.o.o. (RTH)	Mine Rudnik Trbovlje Hrastnik near Trbovlje	NA
Lignite	Premogovnik Velenje, d.d.	Mine at Velenje	NA
Ferroalloys, ferrosilicon	TDR-Metalurgija d.d. (TDR)	Plant at Ruse	NA
Lead, metal, secondary	MPI-Reciklaza Metalurgija, plastika in inženiring d.o.o.	Refinery at Zerjav	35
Salt	SOLINE Pridelava soli d.o.o.	Salt pans at Secovlje and Strunjan	2
Steel, crude	Acroni, d.o.o. [Slovenska Industrija Jekla d.d. (SIJ), 100%]	Plant at Jesenica	400
Do.	Metal Ravne d.o.o. [Slovenska Industrija Jekla d.d. (SIJ), 100%]	Plant at Ravne	130 [e]
Do.	Štore Steel d.o.o. (Unior d.d., 54%)	Plant at Store	185 [e]

[e]Estimated. Do. Ditto. NA Not available.

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The Mineral Industry of Spain

By Alfredo C. Gurmendi

In 2010, Spain was a significant European producer of mineral commodities, including gypsum (third after China and Iran), fluorspar (sixth after China, Mexico, Mongolia, Russia, and South Africa), sand and gravel (industrial) (sixth after the United States, Italy, Germany, the United Kingdom, and Australia), and cement (eighth after China, India, the United States, Turkey, Brazil, Japan, and Iran) (Crangle, 2011; Dolley, 2011; Miller, 2011; van Oss, 2011).

Spain encompasses almost 90% of the Iberian Peninsula and has some of the most mineralized territory in Western Europe, including the volcanic-hosted massive sulfide (VMS) deposits of the Iberian Pyrite Belt (IPB) of southern Spain. The IPB is more than 240 kilometers (km) in length and extends from Seville in southwestern Spain to south of Lisbon, Portugal; it hosts massive sulfide and associated stockwork deposits and dates from the Late Devonian to Middle Carboniferous periods. Within the IPB, at least 80 VMS deposits are thought to exist. The IPB was estimated to have yielded 1.7 billion metric tons of sulfides. The main polymetallic deposits include the Aljustrel, the Aznacollar, the Neves-Corvo, La Zarza, the Rio Tinto, the Scotiel, and the Tharsis. Mining had mostly ceased in these areas, although exploration was continuing. The IPB varies in thickness from a few meters to several hundred meters and consists of a sequence of bimodal volcanics and associated pyroclastic and tuffaceous rocks. Cambridge Mineral Resources plc (CMR) of the United Kingdom's Lomero-Poyatos deposit occurs within Devonian-age intermediate volcaniclastic rocks of the IPB. The deposit is located 30 km to the west of the copper-gold Rio Tinto Mine and 8 km to the west of the zinc-lead-copper Aguas Tenidas Mine (Gibbons and Moreno, 2002, p. 473–510; Cambridge Mineral Resources plc, 2011).

Spain has a long history of mining and has attracted interest from many large gold and base-metal mining companies. Several factors have contributed to this interest, including the highly prospective geology, such as that of the IPB in southern Spain, the Rio Narcea Belt, and the gold discoveries at the Carles and El Valle-Boinas deposits at Boinas in northern Spain. International mineral investment interest has also been encouraged by the country's transparent legislative framework and positive fiscal environment for the extraction of natural resources; its well-developed infrastructure and skilled workforce; its long mining tradition and past successes in exploration and mine development; and the availability of nonrefundable Government grants for both exploration and mine development (Cambridge Mineral Resources plc, 2011).

Minerals in the National Economy

In 2010, Spain's most valuable mineral products included, in order of value, alumina, cement, coal, steel, gold, zinc, and copper. The international financial crisis of 2008–9 and its consequences for the global economy affected the Spanish economy. Spain's gross domestic product (GDP) based on purchasing power parity was $1.400 trillion in 2010 compared with $1.402 trillion in 2009. Spain's inflation was 1.2% compared with -0.3% in 2009; inflation slowed in the closing months of the year largely owing to the notable weakening of domestic demand. Spain had a population of 46.8 million inhabitants in 2010. The total labor force was almost 23 million; of this total, services employed 71.7% of the labor force; industry, 24.1%; and agriculture, 4.2%. The mineral sector contributed 1% of Spain's GDP and employed about 0.5% (82,500) of the services total of 16.5 million. The country's industrial minerals output had decreased by 50% since 2008 owing to the global economic crisis that affected major end markets for construction materials and ceramics (Banco de España, 2011, p. 3, 12; International Monetary Fund, 2011, p. 5; Ministerio de Economía y Hacienda, 2011, p. 18, 29; U.S. Central Intelligence Agency, 2011; U.S. Department of State, 2011).

In 2010, the Government of Spain was focused on increasing the country's trade and investment, modernizing its industrial base, improving its infrastructure, and revising its laws to conform to European Union (EU) guidelines. In terms of the value of its mine output of metallic and nonmetallic minerals and quarry products, Spain continued to be one of the leading EU countries (Banco de España, 2011, p. 18; Sociedad Estatal de Participaciones Industriales, 2011, p. 9).

Government Policies and Programs

Minerals are owned by the state under an arrangement known as the Regalía Principal. The Mining Law of July 21, 1973, and the Hydrocarbon Law of October 7, 1998, govern the mineral industry of Spain. The Dirección General de Política Energética y Minas implements these laws. Law-20 of June 5, 2006, modified the Finance Regime of the Sociedad Estatal de Participaciones Industriales (SEPI), which is a Government-owned holding company that has mining as one sector in its portfolio. In the mineral sector, SEPI owned 100% of Hulleras del Norte, S.A. (HUNOSA), which produced coal; 100% of Minas de Almadén y Arrayanes, S.A. (MAYASA), which produced mercury in the past; 60% of Enusa Industrias Avanzadas, S.A. (ENUSA), which produced nuclear energy; 20% of Red Eléctrica Corporación, S.A. (RECSA), which produced electricity; and 5% of Enagás, S.A. (ENAGAS), which produced natural gas. The Instituto Geológico y Minero de España (IGME) is the principal Government mineral-resource agency. IGME offers assistance in the fields of geology and mining to the private and public sectors through the production of maps and scientific publications (Sociedad Estatal de Participaciones Industriales, 2011, p. 14–15).

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Production

Production data for selected mineral commodities are in table 1. The country was a leading EU producer of natural sodium sulfate, slate, and strontium minerals, and a regionally significant processor of domestic and imported raw materials (table 1; Ministerio de Industria, Turismo y Comercio, 2011, p. 19, 43).

Structure of the Mineral Industry

Data on the capacity and ownership of selected mineral operations are listed in table 2. The mineral industry was made up of a mix of state-owned companies, joint ventures of state and private-sector companies, and privately owned companies. Alcoa Inc. of the United States owned eight production centers across Spain. Alcoa was the leading alumina and aluminum producer in Spain, the sole producer of aluminum oxide (alumina) and primary aluminum, and a manufacturer of rolled products with those materials (Alcoa Inc., 2011b).

Mineral Trade

Spain's total exports amounted to $253 billion and total imports amounted to $315.3 billion in 2010 compared with $326.7 billion and $360.3 billion in 2009, respectively. Mineral fuels and derivatives accounted for almost 4.2% of total exports and almost 12.5% of total imports; aluminum accounted for 1% of total exports and 0.8% of total imports; iron and steel, 2.7% of total exports and 3.6% of total imports; industrial minerals, 2.2% of total exports and 2.5% of total imports; and base metals, 2% of total exports and 1.7% of total imports. In 2010, Spain's top export partners were France (18.7%), Germany (10.7%), Portugal (9.1%), Italy (9%), the United Kingdom (6.3%), and others (46.2%). The country's top import partners were Germany (12.6%), France (11.5%), Italy (7.3%), China (6.8%), the Netherlands (5.6%), the United Kingdom (4.9%), and others (51.3%) (Federation of International Trade Associations, The, 2011; U.S. Central Intelligence Agency, 2011; U.S. Department of State, 2011).

Commodity Review

Metals

Bauxite and Alumina and Aluminum.—Alcoa World Alumina and Chemicals Inc. (AWAC) (Alcoa Inc., 60%, and Alumina Ltd. of Australia, 40%), which was one of the world's leading alumina producers, owned and operated the San Ciprian alumina refinery, which was located in Lugo Province on the east coast of Spain. San Ciprian had an annual production capacity of 1.5 Mt. Bauxite for the refinery was imported from Boke, Guinea. Approximately 70% of San Ciprian's alumina was supplied to Alcoa's aluminum smelters in Spain, and the remaining production was largely sold as hydrated alumina to European chemical manufacturers. San Ciprian's location allowed commodity-grade alumina to be sold within the EU without the high tariffs imposed on non-European suppliers. In 2010, the San Ciprian complex produced 1.5 million metric tons (Mt) of alumina and 408,000 metric tons (t) of primary aluminum as ingots for casting, billets for extrusion, and sheets for lamination. The alumina output was used for the production of primary aluminum and chemical aluminum oxides for the ceramics and chemistry sectors. Alumina, alumina chemicals, alumina hydrates, and primary aluminum were produced by Aluminio/Alúmina Española, S.A. (AESA) in San Ciprian for domestic consumption and for export; primary aluminum was produced by Alcoa Inespal S.A. (AISA) in the Provinces of Aviles and La Coruña, also for domestic consumption and for export. AESA was owned by AWAC, and AISA was a subsidiary of Alcoa (100%) (Alcoa Inc., 2011a, p. 53–54; 2011b; Alumina Ltd., 2011).

Copper, Gold, and Silver.—In 2010, Inmet Mining Corp. of Canada acquired 100% interest in Las Cruces copper mine. Las Cruces is a high-grade VMS copper deposit located on the eastern edge of the IPB about 15 km northwest of Seville. Las Cruces had estimated proven and probable copper reserves of 17.6 Mt grading 6.2% copper. Las Cruces' production capacity was 72,000 metric tons per year (t/yr) of copper cathode as an end product and 1.0 Mt of copper ore for the period 2009–24 (Inmet Mining Corp., 2011a, b).

CMR owned 100% of its local subsidiary Recursos Metállicos SA (RMSA), which held the mining licenses for the Lomero-Poyatos auriferous polymetallic massive sulfide deposit, including the right to production. The licenses were valid for 60 years. CMR's Lomero-Poyatos auriferous polymetallic massive sulfide deposit, which is located near San Telmo, was reported to contain reserves of 3.71 Mt at grades of, in order of value, 3.26 grams per metric ton (g/t) gold, 27.9 g/t silver, 0.87% copper, 1.57% lead, and 1.16% zinc. CMR was seeking joint-venture partners to develop this project.

Ormonde Mining plc of Ireland sought to build a mid-size suite of projects in Spain. These projects would be focused primarily on the Salamanca and the Zamora gold exploration projects (Cambridge Mineral Resources plc, 2011; Ormonde Mining plc, 2011). At Ormonde's La Zarza copper-gold-zinc project, which is located in Huelva Province in southwestern Spain in the IPB, the company conducted an expanded exploration program targeted at defining a large copper resource. The program was being funded through a joint venture with the Chilean copper producer Antofagasta Minerals S.A. (AMSA). AMSA had the right to earn a 51% interest in La Zarza during a 3-year period by spending $7 million on additional exploration and subsequent evaluation activities, with a minimum commitment of $1 million in 2010. AMSA would have the right to increase its interest to 75% after the completion of a feasibility study on La Zarza. Ormonde was also exploring the Salamanca-Zamora area, which the company considered to be one of the most prospective gold terrains in Spain; it was focused on exploring for gold mineralization associated with granites intruded into a variable sequence of meta-sediments. Ormonde's permits covered mineral prospects and occurrences with the potential for high-grade vein and large tonnage low-grade deposits (Ormonde Mining plc, 2011).

Orvana Minerals Corp. (OMC) of Canada owned El Valle-Boinas and the Carles copper and gold skarn deposits in the Rio Narcea gold belt in northern Spain near to the port city

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of Aviles. The deposits had estimated measured and indicated reserves of 6.4 Mt grading 4.7 g/t gold and 0.80% copper and inferred resources of 7.3 Mt grading 5.4 g/t gold and 0.45% copper. OMC was developing the El Valle-Boinas and Carles gold-copper project, and production was planned to begin in the spring of 2011 at a capacity of 750,000 t/yr (Orvana Minerals Corp., 2011).

Spain's estimated silver production remained at about the same level as that of 2009 (3,400 kg). Ormonde's La Zarza copper-gold project was considered to be a potential source of silver; it contained 9.9 Mt of ore grading 3% zinc, 1% copper, 1% lead, 38.9 g/t silver, and 1.6 g/t gold and its inferred resources were 1.3 Mt grading 1.9% copper (Ormonde Mining plc, 2011).

Iron and Steel.—According to the Worldsteel Association, Spain produced 16.3 Mt of crude steel in 2010 compared with 14.4 Mt in 2009, which was an increase of about 13.2%. Compañia Española de Laminación S.A. (Celsa) produced more than 2.4 million metric tons per year (Mt/yr) of steel in 2010. Celsa produced corrugated and smooth round rods, rolled wire, flat rods, squares, angle rods, structural sections, and electro-welded mesh (Compañia Española de Laminación, S.A., 2011; Worldsteel Association, 2011). Corporación Gerdau Sidenor S.A. (Sidenor), which was a leading producer of special steels in Spain, was planning to start producing stainless steel by modernizing the electric arc furnace at its works in Basauri in northern Spain (Corporación Gerdau Sidenor S.A., 2011).

Nickel.—Lundin Mining Corp. of Canada's Aguablanca nickel-copper deposit (which is located in southwestern Spain in the Province of Badajoz) consisted of an open pit and a processing facility with a production capacity of 1.9 Mt/yr of ore. The initial open pit mine life was estimated to be 10.5 years based on mineral reserves of 15 Mt of ore grading 0.6% nickel, 0.5% copper, 0.47 g/t platinum-group metals, and 0.13 g/t gold. In 2010, the Aguablanca Mine produced 1.3 Mt of ore grading 0.5% nickel and 0.4% copper, and concentrates containing 6,296 t of nickel and 5,484 t of copper (Lundin Mining Corp., 2011).

Tungsten.—Ormonde was developing several mining projects in Spain. The Barruecopardo tungsten project, which Ormonde considered to be one of the premier undeveloped tungsten projects in the world, is located in Salamanca Province in the Castilla y Leon region of northwestern Spain. In 2010, Barruecopardo's indicated mineral resources were 6,500 t at a grade of 0.46% WO_3 and its inferred resources were 4,400 t at a grade of 0.44% WO_3, or a total of 10,900 t at a grade of 0.45% WO_3 containing 49,000 t. The Barruecopardo tungsten project was one of the high-grade undeveloped tungsten projects in the world outside of China. The project was 100% owned by Ormonde. Ormonde prepared assessments of mining operations and metallurgical work, and prepared the documentation required for the project permitting process. The initial production rate was expected to be 400,000 t/yr to produce between 130,000 and 150,000 t/yr of WO_3, which equates to between 1,000 and 1,200 t/yr of tungsten metal to be produced by late 2012 (Ormonde Mining plc, 2011).

Zinc.—Spain's zinc metal output was 505,000 t compared with 500,776 t in 2009. Asturiana de Zinc S.A. was owned by Xstrata plc of Switzerland. Xstrata's operations in Spain comprised the San Juan de Nieva zinc smelter and the Arnao zinc semis plant in Asturias and the Hinojedo roasting plant in Cantabria. Asturiana's core business was the refining and production of zinc metal, mainly zinc ingots. According to Asturiana, the San Juan de Nieva plant, which had a capacity of 500,000 t/yr of zinc metal, was the leading zinc smelter in the world and also one of the world's lowest cost operations. CMR's Lomero-Poyatos mineralization contains resources of almost 5.0 Mt grading 24.0 g/t silver, 2.7 g/t gold, 1.3% lead, 1% zinc, and 0.9% copper. Masa Valverde's zinc and copper mineralization contains resources of almost 12 Mt of zinc grading 3% zinc; 80 Mt of copper grading 0.5% copper; and 16.2 Mt of gold grading 1 g/t gold (Asturiana de Zinc S.A., 2011; Cambridge Mineral Resources plc, 2011; Xstrata plc, 2011).

Industrial Minerals

Cement.—In 2010, Spain's estimated cement output was 50 Mt. Cementos Portland Valderrivas S.A. planned to boost its white cement production rate to 900 metric tons per day (t/d) from 700 t/d while achieving a significant emission reduction by modernizing its Tudela plant near Madrid. All the plant's components had been designed to increase its production capacity (Polysius AG, 2011).

Fluorspar.—Spain's fluorspar output amounted to about 131,000 t in 2010 compared with 122,408 t in 2009, or almost a 7% increase. Minerales y Productos Derivados S.A. (MINERSA), which was the EU's leading fluorspar producer, operated three fluorite deposits in Asturias in the north of Spain. MINERSA's production capacity was 150,000 t/yr of fluorspar, mainly acid grade, as well as metallurgic and ceramic grades. The fluorspar operations were located close to the deepwater Port of Aviles. The Emilio, the Jaimina, and the Moscona underground mines produced a combined 420,000 t/yr of crude ore fluorspar (Minerales y Productos Derivados S.A., 2011).

Potash.—Iberpotash S.A. (a subsidiary of Israel Chemicals Ltd. of Israel, which was also named ICL Fertilizers Europe) manufactured and distributed potash and fertilizer and was a leading producer of potash and a significant potash resource in the EU. In 2010, ICL announced the first stage of an efficiency plan for Iberpotash, which would include increasing its potash granulating capacity to meet increased demand for granulated potash, as well as constructing a plant at Suria to produce vacuum salt for the chemical and food industries. Execution of this first stage was planned to be completed in early 2014 at a cost of about $260 million (EUR160 million). The second stage of the plan, which had not yet been approved, would be to expand the Suria's potash production capacity to 1.1 Mt of potash, of which 630,000 t would be granulated potash and 50,000 t would be technical potash, as well as 1.5 Mt of salt (Iberpotash S.A., 2011).

Sepiolite.—Spain's sepiolite output was at about the same level as that of 2009 (770,000 t). The Grupo Tolsa S.A. (Tolsa), which was based in Toledo, was the EU's leading producer of sepiolite and the owner of the world's leading sepiolite deposit. The company's reserves of sepiolite in the River Tajo Basin were thought to be in excess of 15 Mt. Tolsa was the discoverer of sepiolite, which is a light mineral with a high absorption

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capacity that can be used to increase soil water retention and decrease rain runoff and which is used in a variety of products and applications (Grupo Tolsa S.A., 2011).

Mineral Fuels and Other Sources of Energy

Spain has limited energy resources; thus, the country was strongly dependent upon imports of energy. Spain had no major oilfields; one natural gas field located offshore, and coal mines that contained mainly low-quality coal. In 2010, proved petroleum reserves were estimated to be 150 million barrels; natural gas proved reserves were estimated to be 2.5 billion cubic meters; and coal reserves were estimated to be 530 Mt. Spain's refinery capacity was almost 1.4 million barrels per day (BP p.l.c., 2011, p. 16, 30; U.S. Energy Information Administration, 2011b).

Spain produced about 230 billion kilowatthours (Twh) of electricity and consumed about 220 Twh. The largest share of electricity generation came from conventional thermal plants (52%), followed by hydroelectricity (25%), nuclear (15%), and other renewables (8%). Electricity consumption had increased considerably and had strained the electricity infrastructure; several major blackouts were attributed to supply shortages or transmission grid malfunction. In 2010, the largest share of energy consumption came from crude oil (49.8%), followed by natural gas (20.7%), nuclear (9.3%), renewables (8.3%), hydroelectricity (6.4%), and coal (5.5%) (BP p.l.c., 2011, p. 41; Ministerio de Industria, Turismo y Comercio, 2011, p, 15, 23–25, 39; U.S. Energy Information Administration, 2011b).

Coal.—At the end of 2010, proved reserves of anthracite and bituminous coal amounted to 200 Mt and subbituminous coal and lignite amounted to 330 Mt, or a total of 530 Mt. Spain's revised coal production decreased to about 7.2 Mt in 2010 from 7.7 Mt in 2009. Coal continued to be Spain's most plentiful indigenous energy source; however, no production of lignite was reported in 2010. Spain's revised coal consumption decreased to 10.2 Mt in 2010 from 23.1 Mt in 2009 (BP p.l.c., 2011, p. 30–33; Ministerio de Industria, Turismo y Comercio, 2011, p. 15–18; U.S. Energy Information Administration, 2011a).

Private companies produced most of the coal in the country, although the leading producer of bituminous coal was the HUNOSA Group, which was owned by the Government through the SEPI, and the leading producer of lignite was Empresa Nacional de Electricidad S.A. (Ministerio de Industria, Turismo y Comercio, 2011, p. 17–18).

Crude Oil.—Spain's production of crude oil increased to 337,000 barrels (bbl) in 2010 from 250,000 bbl in 2009. Owing to the low level of domestic crude oil production, Spain depended on imports from Russia (15.7%), Iran (12%), Saudi Arabia (11.1%), Mexico (10.8%), Nigeria (10.3%), Libya (9.6%), and other countries (30.5%) (BP p.l.c., 2011, p. 41; Ministerio de Industria, Turismo y Comercio, 2011, p, 15, 23–25, 39; U.S. Energy Information Administration, 2011b).

Natural Gas.—Natural gas production decreased to 20,450 million cubic meters in 2010 from 32,280 million cubic meters (revised) in 2009. Most of Spain's natural gas production came from one offshore field, Poseidon, which was operated by Repsol YPF S.A. The country's natural gas imports were from Algeria (34.8%), Egypt, Nigeria, Qatar, and Trinidad and Tobago (12.2% each), and other countries (16.4%) (BP p.l.c., 2011, p. 41; Ministerio de Industria, Turismo y Comercio, 2011, p, 15, 23–25, 39; U.S. Energy Information Administration, 2011b).

Renewable Energy.—In Europe, Germany and Spain continued to attract the majority of investments in wind power. In 2010, the wind power production capacity of the two countries totaled 47,890 megawatts (MW), which was more than 56.8% of the EU's total capacity of 84,278 MW. The leading European countries with wind power installations were Germany (27,214 MW) and Spain (20,676 MW), followed by Italy (5,797 MW), France (5,660 MW), the United Kingdom (5,204 MW), Portugal (3,598 MW), Sweden (2,163 MW), and Ireland (1,428 MW) (BP p.l.c., 2011, p. 41; European Wind Energy Association, 2011, p. 5–6).

Outlook

Spain continued to be a significant producer of such mineral commodities as, in terms of volume, coal, iron ore, pyrites, copper, lead, zinc, and potash. The country has one of Europe's most important and diversified mining sectors, which produces mostly industrial minerals and stone. Spain's mining output is not sufficient to satisfy domestic demand, however, and the country continues to be a large-scale importer of fuel minerals. The IPB continues to be of interest to domestic and foreign mining companies and is a prime target for exploration activities because of past successes in the discovery of large VMS deposits. Owing to the country's higher dependence on imported energy sources, Spain is likely to direct its attention toward renewable energy investments, such as biofuels, geothermal, solar, and wind. In 2010, more renewable generating capacity was installed in the country; renewables represented 21% of total new installed capacity. Spain's power sector, therefore, continues to grow based on crude oil, coal, nuclear, and renewables. The Government is expected to support projects related to renewable energy, such as biofuels, geothermal, solar, and wind while at the same time increasing its total installed capacity to meet increasing demand (BP p.l.c., 2011, p. 41; European Wind Energy Association, 2011, p. 7–8).

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TABLE 1

SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009[e]	2010[e]
METALS						
Aluminum:						
Alumina[e, 2]		1,000,000	1,500,000 [3]	1,500,000	1,500,000	1,500,000
Metal:						
Primary		349,000	408,000 [3]	408,000	408,000	408,000
Secondary		242,600	243,000	243,000	243,000	243,000
Total		591,600	651,000	651,000	651,000	651,000
Copper:						
Mine output, Cu content		6,616	6,508	7,067	6,987 [4]	5,484 [4]
Metal:						
Blister:						
Primary		263,700	258,291	259,900	260,000 [4]	260,000
Secondary[e]		10,000	10,000	10,000	10,000	10,000
Total		273,700	268,291	269,900 [e]	270,000	270,000
Refined:[e]						
Primary		255,400 [4]	255,000	255,000	255,000	255,000
Secondary		35,000	35,000	35,000	35,000	35,000
Total		290,400	290,000	290,000	290,000	290,000
Germanium oxide, Ge content[e]	kilograms	5,000	5,000	5,000	5,000	5,000
Gold, mine output, Au content	do.	3,421	3,500	3,400	3,400	3,400
Iron and steel, metal:						
Pig iron[e]	thousand metric tons	4,200	4,200	4,200	4,200	4,200
Ferroalloys, electric furnace[e]	do.	180	180	180	180	180
Steel:						
Crude[5]	do.	18,400	19,000	18,600 [r]	14,400 [r, 4]	16,311 [4]
Hot rolled	do.	15,000	15,000	15,000	15,000	15,000
Lead, metal, refined, secondary		129,000	128,000	125,000	125,000	125,000
Nickel, Ni content of concentrate		6,398	6,772	8,136	8,035 [4]	6,296 [4]
Silver, mine output, Ag content	kilograms	2,369	3,400	3,400	3,400	3,400
Zinc, metal, primary and secondary		507,440	494,090	456,050	500,776 [4]	505,000
INDUSTRIAL MINERALS						
Barite, $BaSO_4$		45,000	26,770	11,100	2,814 [4]	2,814 [4]
Cement, hydraulic	thousand metric tons	54,048	54,720	42,088	29,505 [4]	50,000
Clays:						
Attapulgite[e]		20,000	20,000	20,000	20,000	20,000
Bentonite		154,746	147,253	154,534	140,000	140,000
Kaolin, washed		464,049	489,428	355,739	300,000	300,000
Other[e]	thousand metric tons	15,000	15,000	15,000	15,000	15,000
Diatomite and tripoli		52,000	50,000	50,000	50,000	50,000
Feldspar		674,000	683,134	690,256	550,000	580,000
Fluorspar, CaF_2 content:						
Acid-grade		135,864	132,760	127,300	111,810 [4]	120,000
Ceramic-grade		--	14,474	15,930	6,485 [4]	6,500
Metallurgical-grade		17,241	4,963	5,506	4,113 [4]	4,100
Total		153,105	152,197	148,736	122,408 [4]	131,000
Gypsum and anhydrite, crude[e]	thousand metric tons	14,500 [4]	15,000	15,000	11,500 [r]	11,500
Lime, hydrated and quicklime[e]	do.	2,000	2,000	2,000	2,000	2,200
Magnesite, calcined		150,000	196,776	187,626	163,930 [4]	164,000
Mica		4,496	5,569	4,254	4,000	4,000
Nitrogen, N content of ammonia	thousand metric tons	400	400	400	400	400
Pigment, mineral:[e]						
Ocher		140,000	140,000	140,000	140,000	140,000
Red iron oxide		1,500	1,500	1,500	1,500	1,500
Potash, K_2O equivalent[e]		435,191 [4]	435,000	435,000	435,000	400,000

See footnotes at end of table.

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TABLE 1—Continued

SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009[e]	2010[e]
INDUSTRIAL MINERALS—Continued						
Pumice[e]		600,000	600,000	600,000	600,000	600,000
Salt:						
Rock, including byproduct from potash works		2,834	2,850	2,850	2,850 [4]	2,900
Marine and other	thousand metric tons	1,469	1,332	1,291	4,550 [r, 4]	4,600
Sand and gravel, silica sand[6]	do.	130,000	134,000	134,000	134,000 [4]	134,000
Sepiolite, meerschaum		800,000 [e]	717,700	707,950	770,007 [4]	770,000
Sodium compounds, n.e.s.:[e, 7]						
Soda ash, manufactured	thousand metric tons	500	500	500	500	500
Sulfate, natural:						
Glauberite, Na_2SO_4 content		9,500,000	9,500,000	9,500,000	9,500,000	9,500,000
Thenardite, Na_2SO_4 content		165,000	165,000	165,000	165,000	165,000
Manufactured		125,000	125,000	125,000	125,000	125,000
Stone:[e]						
Chalk	thousand metric tons	1,000	1,000	1,000	1,000	1,000
Dolomite	do.	15,000	15,000	15,000	15,000	15,000
Limestone	do.	270,000	270,000	270,000	270,000	270,000
Marble, ornamental	do.	2,600	2,600	2,600	2,600	2,600
Marl	do.	10,000	10,000	10,000	10,000	10,000
Basalt	do.	5,000	5,000	5,000	5,000	5,000
Granite, ornamental	do.	2,500	2,500	2,500	2,500	2,500
Ophite	do.	4,000	4,000	4,000	4,000	4,000
Phonolite	do.	1,800	1,800	1,800	1,800	1,800
Porphyry	do.	1,100	1,100	1,100	1,100	1,100
Quartz	do.	1,100	1,100	1,100	1,100	1,100
Quartzite	do.	2,800	2,800	2,800	2,800	2,800
Sandstone	do.	3,400	3,400	3,400	3,400	3,400
Slate	do.	1,200	1,200	1,200	1,200	1,200
Other	do.	900	900	900	900	900
Strontium minerals, Sr_2O_4 content[e]		188,000	188,000	188,000	188,000	188,000
Sulfur, byproduct:[e]						
Metallurgy	thousand metric tons	500	500	500	536 [r]	539
Petroleum	do.	100	100	100	100	100
Coal (lignite) gasification	do.	1	1	1	1	1
Total	do.	601	601	601	637 [r]	640
Talc and steatite[e]		100,000	100,000	100,000	100,000	100,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, marketable:						
Anthracite	thousand metric tons	8,353	7,872	7,238	7,700 [r, 4]	7,200
Bituminous	do.	3,223	3,128	2,890	2,892 [4]	2,900
Lignite	do.	6,822	6,180	--	--	--
Total	do.	18,398	17,180	10,128	10,592 [r, 4]	10,100
Coke, metallurgical[e]	do.	2,500	2,500	2,500	2,500	2,500
Gas, natural						
Produced	thousand cubic meters	117,916	41,741	46,354	32,280 [r, 4]	20,450
Marketed[e]	do.	330,000	330,000	330,000	330,000	330,000
Peat[e]		60,000	60,000	60,000	60,000	60,000
Petroleum:						
Crude	thousand 42-gallon barrels	330	334	298	250 [4]	337 [4]
Refinery products:						
Liquefied petroleum gas	do.	33,700 [e]	34,104	34,240	34,200	34,200
Naphtha[e]	do.	25,000	25,300	25,401	25,400	25,400
Gasoline, motor	do.	87,600 [e]	88,651	89,006	89,000	89,000
Jet fuel	do.	21,200 [e]	21,454	21,540	21,500	21,500

See footnotes at end of table.

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TABLE 1—Continued

SPAIN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009[e]	2010[e]
Petroleum—Continued:						
Refinery products—Continued:						
Kerosene	thousand 42-gallon barrels	16,000 [e]	16,192	16,257	16,300	16,300
Distillate fuel oil	do.	112,000 [e]	113,319	113,740	114,000	114,000
Residual fuel oil	do.	57,300 [e]	57,988	58,220	58,200	58,200
Other	do.	80,000 [e]	80,960	81,284	81,300	81,300
Refinery fuel and losses	do.	26,000 [e]	26,312	26,417	26,400	26,400
Total	do.	459,000 [e]	464,280	466,105	466,300 [r]	466,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to total shown. [r]Revised. -- Zero.

[1]Table includes data available through July 31, 2011. Sources: Industria y Mineria, 2010. Ministerio de Industria, Turismo y Comercio—Secretaria General de Energia.

[2]Reflects aluminum hydrate.

[3]Reported data. Source: Alcoa Inc. 2010 Annual Report.

[4]Reported figure.

[5]Reported data. Source: Worldsteel Association, January 21, 2011.

[6]Includes sand obtained as a byproduct of feldspar and kaolin production.

[7]Not elsewhere specified.

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TABLE 2
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities	Annual capacity
Alumina	Aluminio/Alúmina Española S.A. (AESA) (Alcoa Inc., 60%, and Alumina Ltd., 40%)	Alumina plant at San Ciprian, Lugo	1,500
Aluminum	do.	Electrolytic plant at San Ciprian, Lugo	228
Do.	Alcoa Inespal S.A. (AISA) (Alcoa Inc., 100%)	Electrolytic plant at Aviles	93
Do.	do.	Electrolytic plant at La Coruña	87
Barite	Minerales y Productos Derivados S.A. (MINERSA)	Mine and plant at Vera, Almeria	100
Bentonite	Süd-Cheme España SL	Mine and plant at Yuncos, Toledo	150
Cement	Ashland S.A.	Puerto de Sagunton, Valencia	2,000
Do.	do.	Villaluenga de la Sagra, Toledo	2,000
Do.	do.	3 other plants	2,000
Do.	35 other companies	49 other plants	38,000
Coal:			
Anthracite	Antracitas Gaiztarro S.A.	Mines at Maria and Paulina	2,000
Do.	do.	Mines near Oviedo	2,000
Do.	Antracitas del Bierzo S.A.	Mines near Leon	1,000
Bituminous	Hulleras del Norte S.A. (HUNOSA)	Various mines and plant	3,300
Do.	Hulleras Vasco Leonesa S.A.	Santa Lucia Mine, Leon	2,000
Do.	Minas de Figaredo S.A.	Mines near Oviedo	1,000
Do.	Nacional de Carbon del Sur (Encasur)	Rampa 3 and San Jose Mines, Cordoba	200
Lignite	Empresa Nacional de Electricidad S.A. (Endesa)	As Pontes Mine, and Andorra Mine, La Coroña	15,000
Copper, metal, content	Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Refinery at Huelva	270
Do.	do.	Electrolytic refinery at Huelva	105
Do.	Industrias Reunidas de Cobre	Smelter at Asua-Bilbao	30
Do.	Elmet SL	Smelter and electrolytic refinery at Berango, Vizcaya	60
Do.	Atlantic Copper S.A. (Freeport MacMoRan Copper & Gold Inc., 100%)	Mines and plant at Arientero near Santiago de Compostela	12
Do.	do.	Alfredo underground mine in Rio Tinto area	30
Do.	Inmet Mining Co., 100%	Open pit mines in Seville, Andalucia, Spain	210
Do.	do.	Cathode Electrowinning at Las Cruces in Sevile	72
Do.	Minas de Rio Tinto S.A.	Cero Colorado open pit mine	20
Do.	Rio Narcea Gold Mines, Ltd. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura	7
Dunite	Pasek España S.A.	Mines and plant at Landoy, Ortigueira	1,500
Fluorspar	Minerales y Productos Derivados S.A. (MINERSA)	Plant at Torre, Asturias	150
Do.	do.	Underground mines at Emilio, Jaimina, and Moscona, Asturias	420
Gold kilograms	Rio Narcea Gold Mines, Ltd.	El Valle and Carles mines, Asturias	3,750
Lead, metal, content	Española del Zinc S.A.	Refinery at Cartagena, Murcia	50
Do.	Compañia La Cruz, Minas y Fundaciones de Plomo S.A.	Smelter at Lineares, Jaen	40
Do.	do.	Refinery at Lineares, Jaen	40
Do.	Tudor S.A.	Secondary smelter at Saragoza	16
Do.	Ferroaleaciones Españolas, S.A.	Secondary smelter at Medina del Campo	12
Do.	Derivados de Minerales y Metales	Secondary smelter at Barcelona	5
Do	Sociedad Minera y Metalúrgica de Peñarroya de España S.A. (Peñarroya, France, 90%)	Opencast mine at Montos de Los Azules	25
Do.	Exploración Minera International España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	16
Magnesite	Magnesitas Navarras S.A.	Mine at Eugui, plant at Zubiri	600
Do.	Magnesitas de Rubián S.A.	Plant at Monte Castel	70
Do.	SA Reverte	Plant at Zaragoza	443
Nickel, metal, content	Rio Narcea Gold Mines, Ltd. (Lundin Mining Corp., 100%)	Aguablanca Mine, Extremadura	8

See footnotes at end of table.

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TABLE 2—Continued
SPAIN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Petroleum:				
Crude	42-gallon barrels per day	Chevron S.A.	Oilfield at Casablanca	300
Refined	do.	Repsol YPF, S.A.	Refinery at Escombreras	200,000
Do.	do.	do.	Refinery at Puertollano	14,000
Do.	do.	do.	Refinery at Tarragona	260,000
Do.	do.	Refineria de Petróleos del Norte S.A. (Petronor)	Refinery at Somorrostro	240,000
Do.	do.	Compañía Española de Petróleos S.A. (Cepsa) [Total S.A., 51.17%, and International Petroleum Investment Co. (IPIC), 48.83%]	Refinery at Gibraltar-San Roque	88,000
Do.	do.	do.	Refinery at La Rabida	37,000
Do.	do.	do.	Refinery at Tenerife	35,000
Do.	do.	Petroleos del Mediterraneo S.A. (Petromed)	Refinery at Castellon de la Plana	120,000
Do.	do.	BP p.l.c., 100%	Refinery at Castellon, Iberia	45,000
Do.	do.	Compañía Iberica Refinadora de Petróleos S.A. (Petroliber)	Refinery at La Coruña	140,000
Potash, ore		Iberpotash S.A. (ICL Fertilizers Europe)	Mines and plants at Suria near Barcelona	1,100
Pyrite		Compañia Española de Mines de Tharsis	Mines and plants at Tharsis and Zarza (closed)	1,300
Do.		do.	Plant at Huelva	600
Do.		Rio Tinto Minera S.A. (Rio Tinto plc, 75%, and Rio Tinto Zinc, 25%)	Mines and plant at Rio Tinto (closed 2001)	900
Sepiolite		The Tolsa Group S.A.	Mine and plant at Vicalvaro near Madrid	1,000
Do.		Silicatos-Anglo-Ingleses S.A.	Mine and plant at Villecas near Madrid	200
Silver	metric tons	Polar Minin Oy (Dragon Mining NL, 50%, and Ormonde Mining plc, 50%)	Valiña silver project, Lugo Province	4
Sodium sulfate		Crimidesa S.A.	Mine and plant at Cerezo de Rio, Burgos	600
Steel		Aceralia Corporación Siderúrgica (Arbed S.A., 35%)	Plants at Aviles, Gijon, Sagunto, and Sestao	8,000
Do.		Compañia Española de Laminacion S.L. (Celsa), 100%	Plant at Barcelona	2,600
Do.		Corporación Gerdau Sidenor S.A. (Sidenor) (Gerdau Group, 50%, and Santander Group, 50%)	Plant at Basauri	2,500
Strontium		Solvay Minerales S.A.	Mines and plant at Escuzar, Granada	85
Do.		Bruno S.A.	Mine and plant at Montevives, Granada	50
Uranium, U_3O_8	metric tons	Empresa Nacional del Uranio (Enusa) (Government, 100%)	Mines and plant near Ciudad Real	500
Zinc, metal content		Asturiana de Zinc S.A. (Azsa) (Xstrata plc, 100%)	Electrolytic zinc plant at San Juan de Nieva Castillon	500
Do.		Española del Zinc S.A.	Electrolytic plant at Cartagena	50
Do.		Asturiana de Zinc S.A. (Xstrata plc, 100%)	Reocin mines and plants (closed 2003)	500
Do.		Exploración Minera International España S.A. (EXMINESA)	Underground mine at Rubiales, Lugo	500
Do.		Sociedad Minera y Metalúrgica de Penarroya-Espana S.A.	Mines and plants at Montos de los Azules y Sierra de Lujar, San Agustin	200

Do., do. Ditto.

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The Mineral Industry of Sweden

By Harold R. Newman

Sweden continued to be an active mining country in 2010. Natural resources have long formed the basis of the country's economy, and the Fennoscandian Shield, which forms a large part of the Nordic countries, has historically been one of the most active mining areas in Europe. The principal mineral-rich mining centers in Sweden were the Norrbotten and the Skellefte districts.

Minerals in the National Economy

Sweden was a significant mineral producer in the European Union (EU). Metal mining and metal products manufacturing dominated the mineral industry and continued to be important to the country's economy. The country has substantial base-metal, gold, and iron ore deposits, which were being developed and exploited actively. The output of the mineral sector contributed 0.3% to Sweden's gross domestic product in 2010. Trade was important to the national economy and enabled Sweden to be one of the leading mineral commodity export countries in the EU (Mbendi Information Services (Pty) Ltd., 2011).

Production

Sweden had a variety of mineral resources and was one of the EU's significant producers of ores and metals, in terms of output. Sweden was the leading producer of iron ore in the EU and was the 10th ranked iron ore producer in the world (Jorgenson, 2011). The country produced ferrous and nonferrous metals, including copper, gold, iron ore, lead, silver, and zinc, and extracted industrial minerals, including crushed stone, dimension stone, and feldspar. In 2010, primary aluminum production and crude steel production increased, along with refinery production of ferrochrome (table 1).

Structure of the Mineral Industry

The Swedish mineral industry was composed mostly of privately owned companies and operated on a free-market basis. The Government was the major equity owner of the Luossavaara-Kiirunavaara AB's (LKAB) iron ore operation, however, and had significant ownership in the Svenskat Stal AB steel operation (48%). Table 2 is a list of the major mineral industry facilities, their production capacities, and the mineral products they produced in 2010.

Mineral Trade

Sweden was a major trading country; the amount of mineral commodities produced depended mainly on the external demand for these mineral commodities. The volume of Swedish exports was up by 14% in 2010 compared with that of 2009. The volume of imports increased by 17% in 2010 compared with that of 2009. In 2010, the volume of exports to the United States increased by 31% whereas the volume of imports decreased by 3% compared with that of 2009 (Statistics Sweden, 2010).

In 2010, U.S. exports to Sweden were valued at $4.7 billion, and U.S. imports from Sweden were valued at $10.5 billion. Significant mineral commodity exports to Sweden from the United States included metallurgical-grade coal (valued at $63.5 million), nuclear fuels materials ($86.1 million), coal and fuels ($56.3 million), precious metals ($54.6 million), and nonferrous metals ($39.6 million). Significant import commodities from Sweden to the United States included semifinished iron and steel mill products (valued at $542.9 million), petroleum products ($416.6 million), fuel oil ($249.3 million), unmanufactured steelmaking and ferroalloying materials ($116.3 million), and iron and steel products, except advanced manufactured ($82.6 million) (U.S. Census Bureau, 2010 a, b).

Commodity Review

Metals

Aluminum.—Kubikenborg Aluminium AB (KUBAL) was one of the leading industrial facilities in central Sweden and the only major aluminum producer in the country. KUBAL reduced its annual aluminum output in 2009 owing to decreased demand; however, it received increased orders in 2010 from clients in Europe and the United States and increased production based on a forecasted growth in demand for aluminum (United Company RUSAL, 2010).

Copper.—Avalon Minerals Ltd. of Australia announced an upgrade and expansion of its estimated resources at the Viscaria copper and iron project located 4 kilometers (km) from LKAB's Kiruna Mine in the Norrbotten area of northern Sweden. Resources at the Viscaria project in 2010 were estimated to be 66 million metric tons (Mt) of ore of both volcanic massive sulfide (VMS) and skarn type mineralization for an estimated 600,000 metric tons (t) of contained copper and 241 Mt of dry units of iron in accordance with the Australian Code for Reporting of Exploration Results, Mineral Resources, and Ore Reserves. VMS deposits are a type of metal sulfide ore deposit, mainly of copper, lead, and zinc, which are associated with and created by volcanic-associated hydrothermal events in submarine environments. Skarn deposits are formed by metamorphic effects at elevated temperatures at the contact of intrusive plutons and carbonate country rocks (Mining Weekly Online, 2010).

Avalon's development strategy at Viscaria was to commence production of copper from the existing open pit in the A, B, and Z zones by 2013; expand the copper and iron estimated resources to more than 100 Mt through ongoing exploration; and reopen the A zone underground mining operations. Avalon

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completed a prefeasibility study, which confirmed the technical and financial viability of the project. A bankable feasibility study was underway in 2010 based on production of 3 million metric tons per year (Mt/yr) of ore by 2013 (Avalon Minerals Ltd., 2010).

In 2010, Boliden Minerals AB's Aitik Mine, which is located in northern Sweden, was Sweden's largest copper mine. The deposit consisted of chalcopyrite and pyrite material yielding copper with gold and silver byproducts. The Aitik Mine produced 67,168 t of copper concentrate with 3,600 kilograms (kg) of silver and 2,000 kg of gold as byproducts. The mine expansion was completed in 2010 and was to increase production capacity from 18 Mt/yr in 2010 to 36 Mt/yr in 2011 (Boliden Minerals AB, 2010a).

Boliden Metals AB's Rönnskär smelter was one of the world's most efficient copper smelters and the leading facility for the recycling of copper and precious metals. Metals and chemicals were extracted from mined concentrates (75%) and various recycled materials (25%). The main products were copper, gold, lead, and zinc clinker. The smelter had the capacity to produce 250,000 t/yr of copper (Boliden Minerals AB, 2010b).

Gold.—Dragon Mining Ltd. of Australia's Svartliden Mine is located 700 km north of Stockholm and west of the Skellefteå Mining District in an area that was developing into a gold-rich province referred to as the "Gold Line." All ore was mined from the eastern area of the Svartliden Mine's open pit and was processed through a carbon-in-leach processing plant. Dragon Mining announced that the assay results from 22,000 meters (m) of core drilling that was done to try extend the operational life of the mine were encouraging and confirmed the presence of higher grade mineralization along the southern edge of the open pit. A technical review was to be undertaken to determine the viability of deepening the open pit to include those identified mineralized zones that were not included in the existing open pit design (Dragon Mining Ltd., 2010).

Lappland Gold Miners AB announced that a new mineral resource estimate at the Faboliden project formed the basis of alternate open pit optimizations and for studies into options for underground mining. The 2010 mineral resource estimate listed the measured and indicated mineral resources at a cutoff grade of 0.4 gram per metric ton (g/t) gold were 57.8 Mt grading 1.05 g/t gold and 2.8 g/t silver. In addition, the estimated inferred mineral resource was 32.4 Mt grading 1.04 g/t gold and 3.4 g/t silver. Both the tonnage and grades in the measured and indicated mineral resource estimates were lower than previously reported estimates (Lappland Gold Miners AB, 2010).

Gold-Ore Resources Ltd. announced the results of an updated mineral resource estimate for the Bjorkdal Mine. The 2010 estimated measured and indicated mineral resources for the open pit and underground mine totaled 26,107 kg of gold. The updated mineral resource estimate indicated a 52% increase in previously estimated resources and could extend the mine life of Bjorkdal. The Skellefteå mining district where the Bjorkdal Mine is located had been the focus of exploration for gold-rich polymetallic deposits since the mid-1920s. The Skellefteå district contained more than 85 known deposits and, in 2010, there were 5 base and precious metals mines operating in the district (Gold-Ore Resources Ltd., 2011).

Iron and Steel.—LKAB's Kiruna Mine was the world's largest underground iron ore mine; it has an ore body that is 4-km long and 80-m thick and reaches to a depth of about 2 km. LKAB announced that it had been granted an environmental permit for a new open pit mine located at Gruvberget. This would be LKAB's first new iron ore mine in 50 years. Production at the new Gruvberget Mine was expected to be 2 Mt/yr. The ore body contains both hematite and magnetite; initially only magnetite would be mined. The open pit contained an estimated 12 Mt of minable ore; however, LKAB estimated that there was an additional 25 Mt of ore available and that the ore was open at depth. This meant that the life expectancy of the mine could extend beyond the planned phase of 8 years (International Mining, 2010).

Industrial Minerals

Fluorspar.—Tertiary Minerals plc of the United Kingdom held an exploration license in the Vasterbotten district of northern Sweden covering the Storuman fluorspar deposit. The Storuman deposit is a large area of flat-lying sandstone-hosted fluorspar mineralization that extends across an area of about 2 km by 1.2 km where the mineralized horizon is typically 3-m to 10-m thick across the license area. The Australian Joint Ore Reserve Committee (JORC)-compliant mineral resource was estimated to be an indicated resource of 25 Mt of 10.28% fluorspar (CaF_2), an inferred resource of 2.7 Mt of 9.57% CaF_2, for a total estimated resource of 27.8 Mt. The JORC mineral estimate was based on the results of 56 diamond drill holes completed by Tertiary Minerals. With an estimated output of about 100,000 t/yr from an open pit operation, the Storuman Mine would be a medium-scale producer and a leading fluorspar producer in Europe (Tertiary Minerals plc, 2010).

Rare Earths.—LKAB was investigating the tailings ponds at the Kiruna and the Malmberget operations; these ponds were thought to contain large quantities of rare-earth elements bound in the phosphate mineral apatite, which is considered an impurity in iron ore. LKAB planned to conduct a study to determine the conditions for the recovery of apatite and rare-earth elements from the tailings in the ponds. Test drilling results indicated the occurrence of about 15 different rare-earth elements in the apatite. Estimates showed that there was enough apatite in the tailings ponds for the production of 400,000 t/yr of concentrates for a period of 14 years. Startup of production was not expected before 2015 (Steel Orbis, 2011).

Mineral Fuels, Related Materials, and Other Sources of Energy

Renewable Energy.—In 2010, Sweden had the largest share of renewable energy in the EU. About 40% of Swedish energy consumption was covered by renewable energy sources. The Government had set its target at 49% use of renewable energy by 2020. Renewable energy was projected to cover about 20% of the EU's final energy consumption by 2020 (Nordic Energy Solutions, 2010).

The Government announced plans for the construction of 2,000 wind turbines during the next 10 years. The goal was to increase energy production from renewable sources by

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25 terawatthours. The Markbygden wind farm would have 1,101 wind turbines and would be the largest wind farm in Europe; the farm's production of energy would be equivalent to that of the production of two nuclear reactors. Construction of the wind farm was expected to be completed by 2022 (Arab Construction World, 2010).

Uranium.—Nuclear power in Sweden received a significant boost when the Government announced plans in 2010 to lift the nearly 30-year ban on nuclear powerplants. The policy change was part of a new drive to increase energy security and combat global warming.

Hodges Resources Ltd. of Australia announced that it had received encouraging results from its 2010 summer exploration programs at the Åsenbogruvan and the Nörr Dottern projects, which are located within the Arvidsjaur uranium province of northern Sweden. The Åsenbogruvan project was claimed to cover multiple occurrences of stratabound and (or) structurally controlled uranium-bearing polymetallic mineralization that was originally identified by the Geological Survey of Sweden (SGU). The presence of hematite-bearing breccias and a multiple commodity signature of mineralization have drawn some comparisons with an iron oxide-copper-gold (IOCG) mineralization style. Historical work on IOCG areas completed by the SGU included surface sampling, trenching, and drilling, which defined at least three uranium prospects of significance within the project area. Uranium mineralization was originally discovered in the Nörr Dottern project area by the SGU; subsequent exploration efforts by the SGU resulted in the discovery of eight significant uranium-bearing prospect areas (Hodges Resources Ltd., 2010).

Mawson Resources Ltd. of Canada's Hotagen uranium mineralized project in northern Sweden consisted of 8,360 hectares of exploration claims and included the Kläppibäcken project, where a 50% upgraded National Instrument 43–101-compliant estimate indicated resources of 1.5 Mt grading 0.08% uranium oxide (U_3O_8). In total, 21 separate areas had been identified at Hotagen, including 66 individual uranium mineralized outcrops. Also, results included 40 assays grading above 0.05% U_3O_8 from these outcrops. This was considered significant, as the outcropping rocks accounted for less than 10% of the surface area in the Hotagen prospect area (Mawson Resources Ltd., 2010).

Outlook

Mining is expected to remain important to Sweden's economy. The global role of Sweden as an iron ore producer will increase as production increases. Within 5 to 10 years, iron ore production is expected to reach 50 Mt/yr. Sweden has substantial base-metal, gold, and iron ore deposits, which are expected to continue to be actively developed and exploited. Foreign companies are likely to continue active exploration efforts in Sweden for base metals, diamond, and, particularly, gold. The Government is expected to continue its efforts to increase the production and use of renewable energy in electricity, heating, cooling, and transport with the goal of 49% use of renewable energy by 2020. Also, Sweden has mining laws that are favorable to the mineral industry and a low corporate tax rate. Companies operating in the mineral resource sector benefit from the country's history of mineral production, available geosciences data, ore potential, extremely low sovereign risk, well-developed infrastructure, and strong mining culture.

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TABLE 1

SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[e]
METALS						
Aluminum, metal:						
Primary		101,180	98,014	81,546	69,708 [r]	78,500
Secondary[e]		32,000	32,000	32,000	30,000	25,000
Total		133,180	130,014	113,546	99,708 [r]	103,500
Copper:						
Mine output, Cu content		86,746	62,905	57,688	55,400 [r]	76,500
Metal:						
Smelter:						
Primary		194,200	203,107	204,204	125,398 [r]	130,000
Secondary		64,243	55,148	67,795	65,000 [e]	60,000
Total		258,443	258,255	271,999	190,398 [r]	190,000
Refined:						
Primary		229,241	213,894	227,774	205,759 [r]	210,000
Secondary[e]		25,000	25,000	25,000	25,000	25,000
Total		254,241	238,894	252,774	230,759 [r]	235,000
Gold:						
Mine output, Au content	kilograms	6,848	5,159	4,900	5,600	6,300
Metal, primary[e, 2]	do.	8,000	8,000	8,000	8,000	8,000
Iron and steel, metal:						
Iron ore concentrate and pellets:[e]						
Gross weight	thousand metric tons	23,622 [r]	24,988 [r]	27,713 [r]	20,389 [r]	27,917 [3]
Fe content (60%)	do.	14,172 [r]	14,993 [r]	16,628 [r]	12,233 [r]	16,750 [3]
Metal:						
Pig iron and sponge iron	do.	3,577	3,815	3,583	3,800 [e]	3,800
Ferroalloys:						
Ferrochromium		136,374	124,403	117,053	31,345	32,000
Ferrosilicon[e]		4,000	4,000	4,000	3,500	3,500
Total		140,374	128,403	121,053	34,845	35,500
Steel, crude	thousand metric tons	5,435	5,673	5,196	2,805	4,844 [3]
Semimanufactures[e]	do.	4,500	4,600	4,200	4,000	4,000
Lead:						
Mine output, Pb content		55,644	63,224	65,100 [e]	69,300 [r]	67,700 [3]
Metal, refined:[e]						
Primary		70,100	69,700	56,800	55,000	56,000
Secondary		43,900	40,000	42,600	42,000	40,000
Total		114,000 [3]	139,700 [3]	99,400	97,000	96,000
Molybdenum, oxide, roasted, Mo content[e]		3,000	3,000	3,000	2,800	2,800
Nickel, metal, secondary[e]		50	50	50	50	50
Selenium, elemental, refined[e]		20	20	20	20	20
Silver:						
Mine output, Ag content	kilograms	292,255	323,171	293,100	288,600 [r]	302,100 [3]
Metal, primary[e]	do.	225,000	225,000	250,000	225,000	230,000
Zinc, mine output, Zn content		210,029	214,576	188,048	192,538	198,687 [3]
INDUSTRIAL MINERALS						
Cement, hydraulic[e]	thousand metric tons	2,600 [3]	2,500 [3]	2,500	2,600	2,600
Diamond, synthetic[e]	thousand carats	20,000	20,000	20,000	20,000	20,000
Feldspar, salable, crude and ground[e]		43,000	42,000	42,000	44,000	44,000
Fertilizer, manufactured:[e]						
Nitrogenous	thousand metric tons	400	400	400	400	400
Phosphatic	do.	10	10	10	10	10
Mixed	do.	300	300	300	300	300
Graphite[e]		800	800	--	--	--
Lime[e]	thousand metric tons	600	600	600	600	700
Quartz and quartzite[e]	do.	700	700	700	700	700

See footnotes at end of table.

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TABLE 1—Continued

SWEDEN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010[e]
INDUSTRIAL MINERALS—Continued						
Stone:[e]						
Dimension:						
Mostly unfinished	thousand metric tons	170	170	170	170	180
Granite	do.	132	132	132	132	124 [3]
Limestone	do.	32	32	32	32	43 [3]
Slate	do.	16	16	16	16	16
Other	do.	6	6	6	6	6
Crushed:						
Dolomite	do.	450	450	450	450	450
Granite	do.	3,500	3,500	3,500	3,500	3,500
Limestone:						
Chalk	do.	80	80	80	80	80
For cement manufacture	do.	4,000	4,000	4,000	4,000	4,000
For lime manufacture	do.	950	950	950	950	950
For other construction and industrial uses	do.	1,800	1,800	1,800	1,800	1,800
For agricultural uses	do.	650	650	650	650	650
For other uses	do.	1,500	1,500	1,500	1,500	1,500
Total	do.	8,980	8,980	8,980	8,980	8,980
Sandstone	do.	20	20	20	20	20
Undifferentiated	do.	30,000	30,000	30,000	30,000	30,000
Other	do.	350	350	350	350	350
Sulfur:[e]						
Metallurgy	do.	240	240	240	240	240
Petroleum	do.	60	60	60	60	60
Total	do.	300	300	300	300	300
Talc, soapstone[e]		14,000	14,000	14,000	15,000	12,000
MINERAL FUELS AND RELATED MATERIALS						
Coke, metallurgical[e]	thousand metric tons	1,400	1,400	1,400	1,400	1,400
Gas, manufactured:[e]						
Coke oven gas	million cubic meters	500	500	500	500	500
Blast furnace gas	do.	3,500	3,500	3,500	3,500	3,500
Peat:						
Agricultural use[e]	thousand cubic meters	1,716 [3]	1,700	1,280	1,400	1,400
Fuel	do.	3,041	3,000	1,500	1,500	1,500
Petroleum, refinery products:[e]						
Liquefied petroleum gas	thousand 42-gallon barrels	5,000	5,000	5,000	5,000	5,000
Naphtha	do.	500	500	500	500	500
Gasoline, motor	do.	35,000	35,000	35,000	35,000	35,000
Jet fuel	do.	600	600	600	600	600
Distillate fuel oil	do.	54,000	54,000	54,000	54,000	54,000
Residual fuel oil	do.	36,000	36,000	36,000	36,000	36,000
Other	do.	21,000	21,000	21,000	21,000	21,000
Refinery fuel and losses	do.	10,000	10,000	10,000	10,000	10,000
Total	do.	162,000	162,000	162,000	162,000	162,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 31, 2012.

[2]Includes only that recovered from indigenous ores, excluding scrap.

[3]Reported figure.

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TABLE 2
SWEDEN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Kubikenborg Aluminium AB (KUBAL) (United Company RUSAL, 100%)	Smelter at Sundsvall	125
Cement		Cementa AB (HeidelbergCement AG, 100%)	Plants at Degerhamn, Skovde, and Slite	3,400
Copper:				
Ore, copper content		Boliden Mineral AB	Mines at Aitik, Garpenberg, Kankberg, Kristineberg, Langdal, Mourliden, Mourliden Ostra, Petiknas, and Renstrom	68
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	240
Feldspar		Berglings Malm & Mineral AB (Omya GmbH)	Mines at Beckegruvan, Hojderna, and Limbergsbo	50
Do.		Silbelco Nordic AS	Mines at Forshammar	30
Do.		Larsbo Kalk AB (Omya GmbH)	Manufactured from marble at Storia	20
Ferroalloys		Vargon Alloys AB	Plant at Vargon	175
Gold:				
Ore, gold content	kilograms	Dragon Mining Ltd.	Svartliden Mine, Skellefte District	300
Do.	do.	Gold-Ore Resources Ltd.	Bjorkdal Mine, Skellefte District	1,200
Do.	do.	Boliden Mineral AB	Mines at Aitik, Akerberg, Kankberg, Kristineberg, Langdal, Petiknas, and Renstrom	2,000
Metal	do.	do.	Smelter and refinery at Ronnskar	15,000
Graphite		Woxna Graphite AB (Tricorona Mineral AB, 100%)	Mine and plant at Kringeltjarn, Woxna (closed 2008)	20
Iron and steel		Svenskt Stal AB (Government, 48%)	Steelworks at Borlange, Lulea, and Oxelosund	3,900
Iron ore		Luossavaara-Kiirunavaara AB (LKAB) (Government, 98%)	Mines at Kiruna and Malmberget	32,500
Kyanite		Svenska Kyanite AB (Svenska Mineral AB, 100%)	Quarry at Halskoberg	10
Lead:				
Ore, lead content		Boliden Mineral AB	Mines at Garpenberg and Renstrom	100
Do.		North Mining Svenska AB	Zinkgruvan Mine at Ammeberg	20
Metal		Boliden Metals AB	Smelter and refinery at Ronnskar	30
Do.		Boliden Bergsoe AS	Smelter and refinery at Landskrona	50
Lime		Svenska Mineral AB	Plants at Rattvik and Boda	250
Limestone		Kalproduction Storugns AB (Nordkalk AB, 100%)	Mines at Gotland Island	3,000
Do.		NordKalk AB	Storugns	3,200
Marble	cubic meters	Borghamnsten AB	Quarry at Askersund	15,000
Petroleum, refined	42-gallon barrels per day	Preem AB (Corral Petroleum Holdings AB (100%)	Refinery at Lysekil	210,000
Do.		Shell Raffinaderi AB	do.	82,000
Do.		AB Nynas Petroleum	Refineries at Gothenburg and Nynashamn	50,000
Silver, metal	kilograms	Boliden Metals AB	Smelter and refinery at Ronnskar	408,000
Do.	do.	Lunden Mining Corp.	Zinkgruvan Mine at Ammeberg	25,000
Zinc, ore, zinc content		Boliden Mineral AB	Mines at Garpenberg, Laisvall, Langdal, and Renstrom	112
Do.		Lunden Mining Corp.	Zinkgruvan Mine at Ammeberg	78

Do., do. Ditto.

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THE MINERAL INDUSTRY OF SWITZERLAND

By Harold R. Newman

The reserves of metalliferrous ore that once existed in Switzerland were mostly depleted, and metal mining remained inactive in 2010. Mining, exclusive of industrial minerals for construction, played only a minor role in Switzerland's economy. Other mineral assets were very limited. Metal processing, which was restricted to primary and secondary aluminum, secondary lead, and steel, depended on imported raw materials or scrap. Switzerland also served as a major diamond exchange. Industrial minerals produced by mining and processing included cement, gypsum, and lime; these were used domestically in construction. The mining operations at Bex produced salt for domestic consumption and export. Switzerland relied on imports for most other mineral commodities. Switzerland's main natural resource was hydroelectric power.

Swiss economic policy was based on free trade, with low import duties and virtually no import quotas. Switzerland was a member of the European Free Trade Association, and trade continued to be Switzerland's key to prosperity (Swissworld.org, 2010).

As the world's 20th ranked exporter, Switzerland shipped $233 billion worth of exports in 2010. Principal exports in 2010 were agricultural products, chemicals, machinery, metals, and watches. The principal recipients were Germany (19.3%), the United States (10.2%), France and Italy (8.4% each), and the United Kingdom (5%). Switzerland imported $226 billion worth of foreign goods in 2010. The major imports included agriculture products, chemicals, fuels, machinery, metals, and vehicles. The principal suppliers were Germany (32.6%), Italy (10.7%), France (9.3%), the United States (5.8%), and the Netherlands (4.5%). The Swiss economy grew by an estimated 2.7% in 2010 (U.S. Central Intelligence Agency, 2011).

Production

Crude steel and salt production increased by more than 10% compared with that of 2009. Data on mineral production are in table 1.

Structure of the Mineral Industry

The Swiss mineral industry was owned privately or by regional governments (Cantons). Federal regulatory control of mineral resources was administered by the national Government, with the 26 regional Cantons granting mining and processing licenses and directly operating electricity generating facilities, gas utilities, and water resource facilities. The final authority for the mineral industry was vested in the Federal Council. Table 2 is a list of major mineral industry facilities, including their locations and capacities.

Commodity Review

Metals

Aluminum.—Novelis Switzerland S.A. was a world leader in the production of aluminum rolled products (both in terms of the volume of production and the technology used) and was the leading rolled products producer in Europe. Novelis produced an estimated 19% of the world's flat-rolled aluminum products. Novelis was also a world leader in the recycling of used aluminum beverage cans; the company recycled an estimated 35 billion used beverage cans per year. Novelis's particular specialty was providing flat-rolled products for the automotive sector (Novelis Switzerland S.A., 2010b).

Novelis announced that it would invest $11.3 million in its aluminum plant at Sierre to help meet the growing demand for aluminum sheet. The expansion project would increase the ingot production capacity and improve the flow of material through the complex. It would also include the installation of a scrapper used to machine the ingot surfaces prior to hot rolling, as well as ancillary handling equipment and environmental controls. The complex at Sierre had ingot-casting, hot- and cold-rolling, and heat-treatment capability, and modern laser-blanking lines (Novelis Switzerland S.A., 2010a).

Copper.—Schmelzmetall AG was a leading manufacturer of copper-based high-performance alloys in the European Union (EU). Schmelzmetall's HOVADUR® alloys were manufactured from raw materials that were smelted and cast in inductively heated vacuum furnaces and further processed into semifinished products and finished parts (Schmelzmetall AG, 2010).

Gold.—Although Switzerland did not mine gold, it was home to several refineries. These included Argor-Heraus S.A's refinery at Mendrisio, Cendres+Métaux S.A.'s refinery at Biel-Bienne, Produits Artistiques de Métaux Précieux S.A.'s refinery at Castel San Pietro, and Valcambi S.A.'s refinery at Balerna.

Iron and Steel.—Scrap steel is a valuable source of material in a country short of raw materials. About 1 million metric tons per year (Mt/yr) of scrap steel was collected through a network of collection points, scrap processors, and traders. Stahl Gerlafingen AG was a major consumer of this material and operated a modern high-efficiency electric arc furnace (EAF) for melting scrap steel at its plant at Gerlafingen. The company was the leading supplier of reinforced-steel products in Switzerland (Stahl Gerlafingen AG, 2010).

The result of the recycling process initiated steel production at Swiss Steel AG. The iron scrap was melted in an 80-metric-ton (t) EAF then transferred to a ladle furnace for alloy and micro-alloy treatment and adjustment. Steel billets that were 11 meters long and 150 millimeters wide were produced by a continuous casting machine; the billets were then rolled into bars or wire rod (Swiss Steel AG, 2010).

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Industrial Minerals

Cement.—Holcim (Schweiz) AG was one of the world's leading suppliers of cement and aggregates and the leading cement, concrete, and gravel producer in Switzerland. Holcim operated seven cement plants and grinding stations, which had a combined production capacity of 4.3 Mt/yr. The company also produced asphalt and ready-mix concrete. In 2010, Holcim acquired four ready-mix concrete plants in the Basle area from the Lafarge Group of France. Holcim reported that whereas the volume of cement and ready-mix sales in 2010 remained about the same as in 2009, the building materials market remained under pressure (Aggregates Business Europe, 2011).

Salt.—Saline de Bex S.A. (Selbex) was active in the extraction and production of salt. Selbex's annual production was about 30,000 t. Most of the salt produced was destined for winter road maintenance, and about 6,000 t was for water treatment, 3 t was for human consumption, and about 2.5 t was for animal feed (Saline de Bex S.A., 2010).

Mineral Fuels

Natural Gas.—Switzerland did not produce natural gas in 2010. Imported natural gas met a part of Switzerland's energy requirements. Natural gas sales increased by about 12% in 2010, partly owning to the more widespread use of natural gas and biomethane for vehicle fuel. This fuel displaced an equivalent amount of 22 million liters of gasoline, which was an increase of 18% compared with the amount displaced in 2009 (NGV Global, 2011).

Petroleum.—Tamoil (Suisse) S.A.'s Collombey refinery, which was one of two petroleum refineries in Switzerland, is located in the Canton of Valais about 100 kilometers (km) from Geneva. The refinery produced about 2.7 Mt/yr of petroleum products from crude petroleum brought to Collombey from the Port of Genoa, Italy, through a 340-km-long pipeline. Products produced at the refinery included diesel, heating oil (light and heavy), kerosene, liquefied petroleum gas, unleaded 98 octane gasoline, and unleaded 95 octane gasoline. The Collombey refinery and the extensive network of gasoline stations across the country could be affected by the United Nations's financial and trade embargo sanctions against Libya (Swissinfo.ch, 2010).

Petroplus Refining Cressier S.A.'s Cressier refinery was located at Cressier. The petroleum refinery was an integrated atmosphere-vacuum distillation visbreaking and thermal cracking refinery with a nameplate capacity of 68,000 barrels per day. Cressier's crude petroleum supply arrived by pipeline directly from the marine shipping terminal at Fos-sur-Mer, France. The refinery's diesel and gasoline production met the EU's mandatory 10 parts per million (ppm) sulfur limit. Crosier's production of light and middle distillates, such as blended diesel, diesel, gasoline, and jet fuel, were sold mostly in Switzerland. Cressier also produced EcoClean, which was a grade of heating oil that contained less than 50 ppm sulfur (Petroplus Holdings AG, 2010).

Outlook

The outlook for Switzerland's mineral industry is for little change. Metal mining is not likely to be initiated, and industrial minerals are expected to be produced according to local demand. Limited exploration for natural gas and petroleum is expected to continue.

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TABLE 1

SWITZERLAND: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Thousand metric tons unless otherwise specified)

Commodity[3]		2006	2007	2008	2009	2010
METALS						
Aluminum:						
Primary	metric tons	40,000	25,000	--	--	--
Secondary	do.	190	175 r	50	25	25
Copper, refined		NA	NA	NA	NA	NA
Gold, refined		NA	NA	NA	NA	NA
Iron and steel, metal:						
Crude steel		1,252 r, 4	1,264 4	1,257 4	984 4	1,330 4
Semimanufactures		700	700	700	600	700
Lead, refined, secondary	metric tons	9,000	9,000	8,000	5,000	5,000
INDUSTRIAL MINERALS						
Cement, hydraulic		4,000	4,000	4,000	4,000	4,000
Gypsum		300	300	300	300	300
Lime		90 r	90 r	90 r	80	80
Nitrogen, N content of ammonia		30	30	30	30	30
Salt		560	560	535	435 4	500
Sulfur, from petroleum refining	metric tons	3,000	3,000	3,000	3,000	3,000
MINERAL FUELS AND RELATED MATERIALS						
Petroleum refinery products:						
Liquefied petroleum gas	thousand 42-gallon barrels	2,500 r	2,343 r, 4	2,500	2,500	2,500
Gasoline	do.	10,000	10,880 r, 4	10,000	10,000	10,000
Distillate fuel oil	do.	18,000 r	16,203 r, 4	16,000 r	16,000	16,000
Residual fuel oil	do.	10,000 r	3,909 r, 4	4,000	4,000	4,000
Bitumen	do.	800	800	800	800	800
Refinery fuel and losses	do.	2,600 r	2,500 r	2,500	2,500	2,500
Total[5]	do.	43,900 r	36,635 r	35,800	35,800	35,800

rRevised. do. Ditto. -- Zero.

[1]Estimated data are rounded to no more than three significant digits; may not add to totals shown.

[2]Table includes data available through August 31, 2011.

[3]In addition to the commodities listed, a variety of crude construction materials (common clay, sand and gravel, and stone) were produced but output was not reported.

[4]Reported figure.

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TABLE 2
SWITZERLAND: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Aluminum		Novelis Switzerland S.A. (Hindalco Industries Ltd., 100%)	Plant at Sierre	130
Cement		Holcim (Schweiz) AG (Holcim Group, 100%)	Plants at three locations	4,300
Copper, alloy	metric tons	Schmelzmetall AG	Refinery at Gurtnellen	2,400
Gold	kilograms	Argor-Heraeus S.A.	Refinery at Mendrisio	350,000
Do.	do.	Cendres+Métaux S.A.	Refinery at Biel-Bienne	NA
Do.	do.	Metalor Group	Refinery at Neuchâtel	270,000
Do.	do.	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	450,000
Do.	do.	Valcambi S.A.	Refinery at Balerna	350,000
Lead, secondary		Metallum Group	Smelter at Pratteln	32
Petroleum, refinery	barrels per day	Tamoil (Suisse) S.A. (Colony Capital LLC, 65%, and Government of Libya, 35%)	Refinery at Collombey	72,000
Do.	do.	Petroplus Refining Cressier S.A. (Petroplus Holdings AG)	Refinery at Cressier	68,000
Platinum-group metals	kilograms	Produits Artistiques de Métaux Précieux S.A. (MKS Finance SA, 100%)	Refinery at Castel San Pietro	30,000
Salt		United Swiss Salt Works (25 Cantons, except Vaud, 100%)	Saline plants at Riburg and Schweizerhalle	500
Do.		Saline de Bex S.A. (Canton of Vaud, 100%)	Saline mine and plant at Bex	50
Steel		Stahl Gerlafingen AG (Schmolz and Bickenbach AG, 100%)	Plant at Gerlafingen	650
Do.		Swiss Steel AG	Plant at Emmenbrucke	300

Do., do. Ditto. NA Not available.

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The Mineral Industry of Tajikistan

By Elena Safirova

Tajikistan has a wide range of mineral resources. Reportedly, there are more than 400 mineral deposits of anthracite coal, antimony, bismuth, boron, copper, gemstones, gold, iron ore, lead, manganese, molybdenum, natural gas, nickel, petroleum, phosphorus, salt, silver, strontium, tin, tungsten, uranium, zinc, and other minerals. Mining that successfully developed in the 1980s had recently declined because of economic and political crises in the country. Aluminum production was the main source of export revenue for Tajikistan in 2010 (Embassy of the Republic Tajikistan in Japan, The, 2012; U.S. Central Intelligence Agency, 2012; U.S. Department of State, 2012).

Although Tajikistan has coal, oil, and natural gas reserves, the main energy source of the country is hydroelectric power. Hydroelectric power accounted for more than 75% of the country's total energy output. Moreover, Tajikistan has vast hydroelectric potential. At present, only about 6% of hydroelectric potential of the country was being used (European Bank for Reconstruction and Development, 2010).

Minerals in the National Economy

In 2010, Tajikistan's gross domestic product (GDP) was estimated to be $5.64 billion, and GDP growth was 6.5%. Industrial production accounted for 22.4% of the GDP and increased over the course of the year by 7.5%; Tajikistan was ranked 30th in the world in terms of its industrial growth rate. Production of mineral products constituted a significant portion of the national economy. In 2010, Tajikistan exported 338,000 million metric tons (Mt) of aluminum, or 96.9% of all the aluminum the country produced. The export revenue from aluminum was $735.7 million, or 56.4% of all national export revenues (Agency on Statistics Under President of the Republic of Tajikistan, 2011; Polpred.com, 2011; U.S. Central Intelligence Agency, 2012). The increase in the price of aluminum on the world market was an important contributor to the revenue growth. Even though aluminum production decreased from 2009 by almost 3%, the market value of aluminum produced in the country increased by 27% (to $761 in 2010 from $559.3 in 2009) (United Nations Development Programme, 2011).

Production

In 2010, Tajikistan increased its production of gold by 50.6%; cement, by 47.8%; natural gas, by 18.8%; and coal, by 13.4%. At the same time, gypsum production decreased by 44.7%. Other production data are in table 1.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Aluminum.—Central Asia GUP TALCO (Tajik Aluminum Co.) (TALCO) was Tajikistan's only aluminum producer; it had the capacity to produce 517,000 metric tons per year (t/yr). During the past several years the company was operating at 70% to 80% of capacity. In 2010, aluminum production fell short of its 2010 target of 442,000 metric tons (t) and was only 348,850 t, which was a 3% decrease compared with that of 2009. The decrease in production was attributed to aging equipment and a shortage of qualified personnel. Some of TALCO's best engineers had gone abroad to seek employment; in 2010, the monthly pay of metallurgists at TALCO was only between $300 and $400 per month (Metaltorg.ru, 2011; Tajik Aluminium Co., 2012; Zhavoronkova, 2012).

Gold.—In 2010, Tajikistan produced 2,049 kilograms (kg) of gold, which was an increase of more than 50% compared with that of 2009. In 2010, the enterprises that produced gold in Tajikistan were the Tajik-Canadian joint venture Aprelevka, the Tajik-British joint venture Darvaz, the Tajik-Chinese joint venture SP Zerafshan, and Government-owned Tilloi Tochik [Tajik Gold].

The main gold producer in Tajikistan, SP Zerafshan, produced 1,115.2 kg of gold in 2010. SP Zerafshan also worked on modernization and construction of new facilities during the year. The Chinese partner ZiJin Mining Group Co. Ltd. invested $50 million in the joint venture and was planning to invest an additional $10 million in 2011 in modernization efforts. SP Zerafshan was planning to increase gold production to 1,500 kg in 2011 (Ergasheva, 2011).

Industrial Minerals

Cement.—Although not a leading cement producer, Tajikistan increased production of cement from 2000 to 2010 by sixfold. In 2000, Tajikistan produced 50,000 t of cement (Levine and Wallace, 2000). In 2010, the country produced 288,200 t of cement. In 2010, Tajikistan had about 10 plants that produced cement. The largest one, state-owned OAO Tajikcement, specialized in the production of portland cement and had a capacity of 1.1 million metric tons per year (Mt/yr). In recent years, however, the plant was operating at a fraction of its capacity, mostly because of technological obsolescence and lack of energy to power the plant. Tajikistan had to import natural gas for its cement plants from Russia, and intended eventually to switch to locally produced coal. In January 2011, it was announced that an Iranian company would invest about $300 million in building two new cement plants in Tajikistan. When completed, the new coal-powered plants were expected to produce 2 Mt/yr of cement (Nezavisimyi Stroitel'nyi Portal, 2011; Sodiqov, 2011).

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Hydropower.—The largest hydropower plants in the country were the Nurek plant, which had a production capacity of 3,000 megawatts (MW), the Sangtuda 1 plant (670 MW), and the Baipaza plant (600 MW). The electric transmission and distribution system of the country was largely outdated (European Bank for Reconstruction and Development, 2010).

Outlook

Tajikistan has significant undeveloped mineral resources, including a large number of metals, rare earths, and uranium. Despite a high rate of economic growth during the 2000s, developing those resources is likely to be difficult. Tajikistan's biggest challenge in the coming years is expected to be increasing the rate of private investment in the national economy. The World Bank's 2011 Doing Business report ranked Tajikistan 147 of 183 countries because of high levels of bureaucracy, corruption, and Government inefficiency. Lack of infrastructure, the country's remote location, and mountainous terrain together led to extremely high costs of moving goods within the country and abroad and are likely to serve as an additional deterrent to the country's economic development. Tajikistan's energy sector will be critical not only for the power it provides to the domestic industry but as a potential source of energy exports to neighboring countries (World Bank, The, 2011).

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TABLE 1

TAJIKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity[2]		2006	2007	2008	2009	2010[e]
METALS						
Aluminum, primary		413,800	419,060	339,450	359,385	348,850 [3]
Antimony, Sb content[e]		3,480 [3]	2,000	2,000	2,000	2,000
Gold	kilograms	1,920	2,000	1,672	1,361	2,049 [3]
Lead, Pb content[e]		800	800	800	800	800
Mercury, Hg content[e]		30	30	30	30	30
Silver, Ag content[e]	kilograms	3,110 [r]	3,110 [r]	3,110 [r]	3,110 [r]	3,110
INDUSTRIAL MINERALS						
Cement		281,500	313,100	190,400	195,000 [r]	288,200 [3]
Fluorspar[e]		8,500	8,500	8,500	8,500	8,500
Gypsum		8,500	8,500 [e]	8,500 [e]	26,400 [r]	14,600
Nitrogen, N content of ammonia		32,300 [r]	24,500 [r]	23,000 [r]	-- [r]	NA
Salt[e]		52,459 [3]	52,000	52,000	52,000	52,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		104,600 [r]	181,400 [r]	198,500 [r]	176,100 [r]	199,700 [3]
Lignite[e]		[4]	[4]	[4] [r]	[4] [r]	[4]
Total		104,600	181,400	198,500	176,100	199,700 [3]
Natural gas	thousand cubic meters	20,000 [r]	17,400 [r]	16,100	19,200 [r]	22,800 [3]
Petroleum, crude:						
In gravimetric units		21,700 [r]	23,700 [r]	25,900 [r]	26,200 [r]	27,000 [3]
In volumetric units[e]	42-gallon barrels	110,000	102,000	85,900	79,600	78,500

[e]Estimated; estimated data are rounded to no more than three significant digits. [r]Revised. NA Not available. -- Zero.

[1]Table includes data available through March 20, 2012.

[2]In addition to the commodities listed, Tajikistan had produced a number of other mineral commodities in the past, but available information is inadequate to determine if production was still taking place.

[3]Reported figure.

[4]Available information is not adequate to make a reliable estimate of output.

TABLE 2

TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Aluminum	TALCO aluminum smelter [formerly the Tajikistan Aluminum Smelter (TadAZ)]	Tursunzade	517,000
Antimony, ore	Anzob mining-beneficiation complex	Dzhizhikrutskoye Sb-Hg deposit	700,000
Antimony, metal	Isfara hydrometallurgical plant	Isfara	500
Arsenic	Mosrif deposit	NA	NA
Bismuth	Isfara hydrometallurgical plant	Isfara	500
Do.	Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	25
Bismuth, copper, fluorspar, gold, silver, zinc (ore processing)	Adrasman mining-beneficiation complex	Kanimansurskoye deposit	650,000
Boron	Yakarkharskoye deposit	Badakhshon region	NA
Cement	OAO Tajikcement	Dushanbe	1,000,000
Coal	Fan-Yagnob hard coal deposits	Pyandzh region	50,000
Do.	Isfara hydrometallurgical plant	Isfara	300,000
Do.	Shurab brown coal deposit	Shurab region	NA
Copper-lead-zinc	Leninabad mining-beneficiation complex	Yuzhno-Yangikanskiy deposit	2,500
Dolomite	Yavan electrochemical complex	Pashkharvoskoye deposit	NA

See footnotes at end of table.

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TABLE 2—Continued

TAJIKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Fluorspar, concentrate		Takob mining-beneficiation complex	Takob and Krasnye Kholmy deposits	60,000 [2]
Gold, in ore	kilograms	Aprelevka joint venture	Aprelevka deposit	200
Do.	do.	Darvaz joint venture	Yak-Suyskoye deposit, Khatlon Province	2,000
Do.	do.	Tajikzoloto mining-beneficiation complex, Pamir Artel	Darvazy and Rankul placer deposits, placers in central and southern parts of country	5,000 [2]
Do.	do.	Zerafshan Gold Co.	Dzhilau and Taror deposits, Sughd Province	2,500 [2]
Gold, ore processing	do.	Kansayskaya factory	Aprelevka, Burgunda, Kyzyl-Chek, and Shkol'noye deposits	165,000 [2]
Do.	do.	Vostokredmet refinery	Qizfaquz	NA
Lead-zinc		Adrasman mining-beneficiation complex	NA	NA
Do.		Altyn-Topkan mining directorate (China Global New Technology Export and Import)	Altyn-Topkan deposit (mining ceased in 1997)	NA
Do.		do.	Pay Bulak deposit (mining ceased in 1997)	NA
Do.		Kansayskoye mining complex	Karamazor region	NA
Do.		Takaeliyskiy metallurgical complex	NA	NA
Limestone		Dushanbe cement complex	Kharangonskoye deposit	NA
Loam		do.	Varzobskoye Ushchel'ye deposit	NA
Marble		Dal'yan Bolo deposit	Ganchinskiy region	NA
Do.		Dashtak deposit	Darvaz region	NA
Do.		Jilikul deposit	Pendzhikentskiy region	NA
Mercury		Anzob mining-beneficiation complex	Dzhizhikrutskoye deposit	150
Natural gas and petroleum:				
Natural gas	thousand cubic meters	Sixteen oil-gas deposits under exploration, which include Ayritanskoye, Madaniyatskoye, and Ravatskoye	Fergana depression	200,000 [2]
Petroleum		Beshtentyakskoye, Kichik-Belskoye, Shaambary, and Uzunkhorskoye deposits	Southern Tajik depression	200,000 [2]
Salt		Ashtskiy plant	Kamyshkurganskoye deposit	NA
Do.		Khoja-Sartez, Samanchi, and Tanabchi deposits	NA	NA
Do.		Voseyskiy plant	Khodzha-Muminskoye deposit	NA
Do.		Yavan electrochemical complex	Tut-Bulakskoye deposit	NA
Silver	kilograms	Adrasman mining-beneficiation complex	Bolshoy Kanimansur deposit	15,000
Strontium, ore		Chaltash, Chilkutan, and Davgir deposits	Khatlon Province	180,000
Tin-tungsten		Tafkon deposit	NA	NA
Tungsten ore		Maykhura deposit	Central Tajikistan	150,000

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

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The Mineral Industry of Turkmenistan

By Elena Safirova

Turkmenistan has a wide variety of mineral deposits on its territory, but the most important from the economic perspective are its oil and gas resources. Turkmenistan's natural gas reserves are among the largest in the world and were estimated by different sources to be from 7 to 10 trillion cubic meters. Until recently, however, the country faced significant difficulties in bringing its mineral resources to the world markets. Turkmenistan's gasfields—several of which are among the world's largest—are located in the Amu Darya basin in the southeast, the Murgab basin in the east, and the South Caspian basin in the west. Recent discoveries at the South Yolotan gasfield in the eastern part of the country are likely to add significantly to the current proven reserves. Turkmenistan's oil reserves as of January 2012 were estimated to be 600 million barrels according to Oil and Gas Journal. Most of Turkmenistan's oilfields are located in the west of the country in onshore areas near the Caspian Sea (U.S. Central Intelligence Agency, 2012; U.S. Department of State, 2012; U.S. Energy Information Administration, 2012).

Among the nonfuel minerals produced in Turkmenistan are bentonite, bischofite, bromine, epsomite, iodine, salt, sodium sulfate, and sulfur. The State Corporation Turkmengeologiya had conducted numerous studies of the geologic structure of the country. Its responsibilities include exploration and systematic documentation of the country's mineral resources and providing support for new mineral enterprises and for expansion of existing industrial enterprises (State Corporation Turkmenologiya, 2012).

Production

Detailed production data and other information regarding mineral production for most mineral commodities except natural gas and oil have not been available for a number of years. The State Committee on Statistics of Turkmenistan reported only production growth rates for most of the economic categories that it tracks, including those for construction materials, metallurgy, mineral commodities, and mineral fertilizers. Absolute values of production and exports were available only for oil and gas. Production estimates in table 1 reflect past levels of production. According to the estimates by the U.S. Central Intelligence Agency, industrial production contributed 24.1% to Turkmenistan's gross domestic product (GDP). Natural gas was the country's major export commodity; in 2010, Turkmenistan exported 24,600 billion cubic meters of natural gas (U.S. Central Intelligence Agency, 2012; U.S. Energy Information Administration, 2012; State Committee on Statistics of Turkmenistan, 2012).

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Mineral Fuels

Natural Gas.—In 2010, Turkmenistan produced 44,270 billion cubic meters of natural gas. [The 2009 level of production declined to 38,000 billion cubic meters following a blast on one of the Central Asia-Center (CAC) pipelines and was subsequently resumed at a reduced level.] Historically, a majority of Turkmen gas was shipped to Russia where it was either used or continued transit to Europe. The export routes for carrying Turkmen gas were the two CAC pipelines, which connected Turkmenistan with Russia and other countries of the former Soviet Union. In November 2010, Turkmenistan's Ministry of Oil, Gas, and Mineral Resources announced that the country's new energy strategy was to increase gas production to 230 billion cubic meters per year by 2030, of which 180 billion cubic meters would be exported (Reuters.com, 2010). The country's leadership realized that the key means to achieving this goal was to diversify its export routes for its natural gas resources.

In addition to the two CAC pipelines and the Korpezh-Kurt Kui pipeline, which linked Turkmenistan and Iran, Turkmenistan was constructing several new pipelines with the goal of bypassing transit through Russia. A second pipeline connecting Turkmenistan to Iran (the Dauletabad-Khangiran pipeline) was initiated in the beginning of 2010; when the second phase of construction is completed, the $550 million pipeline was to have a capacity of 12 billion cubic meters per year. The Central Asia-China Pipeline (CACP) connects Turkmenistan's eastern fields through Uzbekistan to western China. The pipeline began operations at the end of 2009 and had an initial capacity of 30 billion cubic meters per year; the pipeline's capacity was expected to increase to about 60 billion cubic meters per year by 2015. The construction of the East-West pipeline was initiated in May 2010. The pipeline would connect Turkmenistan's southeastern gasfields to the Caspian Sea and serve as a potential transit link to Europe using routes along the Caspian Sea. The pipeline's capacity was expected to be 30 billion cubic meters, and the construction was planned to be completed by 2015. The Turkmenistan-Afghanistan-Pakistan-India (TAPI) pipeline was a trans-Afghanistan pipeline intended to reach markets in Pakistan and India. The pipeline's proposed capacity was 35 billion cubic meters per year, and it would span more than 1,500 kilometers. The four countries (Turkmenistan, Pakistan, Afghanistan, and India) signed an inter-Governmental agreement in December 2010, but the timing of the project is still unknown because of uncertain financial and security arrangements. The Trans-Caspian Gas pipeline (TCGP) was proposed to connect Turkmenbashi City, Turkmenistan, and Baku, Azerbaijan. The pipeline would bypass both Russia and Iran and would connect to the proposed Nabucco pipeline

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between Turkey and Austria. TCGP was proposed to have a capacity of 30 billion cubic meters per year and would run across the floor of the Caspian Sea at an estimated cost of $5 billion; however, the disputes concerning Caspian seabed jurisdiction could significantly undermine the project's viability (Bekieva, 2010; Pomfret, 2011; U.S. Energy Information Administration, 2012).

In December 2009, Turkmenistan awarded gasfield service contracts worth almost $10 billion to companies from China, the Republic of Korea, and the United Arab Emirates to develop the South Yolotan field, which is one of the world's largest gasfields. Turkmenistan planned to extract as much as 30 billion cubic meters of natural gas per year from the South Yolotan field. The cost of development was supported by a credit line valued at up to $4 billion from China Development Bank Corp. (Bierman and Shiryaevskaya, 2009).

Outlook

For the next few years, Turkmenistan is expected to continue an aggressive expansion of its gas pipelines to the east (China) and to the south (Pakistan and India). Expansion to the west in the general direction of Europe is more problematic because of conflicts of interest related to both the TCGP and the Nabucco pipeline projects. In May 2009, the European Parliament, after 11 years of consideration, approved a trade agreement with Turkmenistan. Many analysts believe that the main reason for the approval was the hope that the agreement would eventually lead to direct supply of natural gas to Europe from Turkmenistan (International Centre for Trade and Sustainable Development, 2009). The approval of the trade agreement has enabled direct shipments of Turkmen energy goods to Europe.

Although it is impossible to predict whether the Government of Turkmenistan will be able to reach gas production of 240 billion cubic meters by 2030, it is clear that the country has sufficient gas reserves to achieve this goal. What remains to be seen, however, is whether the country will be able to effectively attract foreign firms to increase its gas production significantly and use the proceeds to propel the country to higher living standards.

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TABLE 1

TURKMENISTAN: ESTIMATED PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS						
Bentonite		50,000	50,000	50,000	50,000	50,000
Bentonite powder		250	250	250	250	250
Bischofite		100	100	100	100	100
Bromine	kilograms	150,000	150,000	150,000	150,000	150,000
Cement[3]		920,600	941,000	1,025,000	1,100,000	1,140,000
Epsomite		NA	NA	NA	NA	NA
Ferrous bromide, 51% Br		85	85	85	85	85
Gypsum		100,000	100,000	100,000	100,000	100,000
Iodine		270,000	270,000	270,000	270,000	270,000
Lime		16,000	16,000	16,000	16,000	16,000
Nitrogen, N content of ammonia		250,000	270,000	270,000	270,000	270,000
Salt		215,000	215,000	215,000	215,000	215,000
Sodium sulfate		60,000	60,000	60,000	60,000	60,000
Sulfur		9,000	9,000	9,000	9,000	9,000
MINERAL FUELS AND RELATED MATERIALS						
Natural gas[3]	million cubic meters	63,201	72,300	70,501	38,000	44,270
Petroleum:						
Crude:						
In gravimetric units		8,950,000 [3]	9,750,000 [3]	9,678,000 [3]	8,850,000 [r]	9,097,800 [3]
In volumetric units[e]	42-gallon barrels	65,100,000	70,900,000	70,400,000	64,300,000	66,100,000
Refinery products:						
In gravimetric units		6,500,000	7,000,000	7,300,000 [3]	7,600,000	7,752,000 [3]
In volumetric units[e]	42-gallon barrels	52,300,000	56,300,000	58,700,000	61,100,000	62,322,000 [3]

[r]Revised. NA Not available.

[1]Estimated data are rounded to no more than three significant digits.

[2]Table includes data available through March 22, 2012.

[3]Reported figure.

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TABLE 2

TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity
Ammonia thousand metric tons	Maryzoat Association	Mary Region	400,000
Argillite cubic meters	Keramzit plant	Yagmanskoye deposit	200,000
Barite-witherite	Arpaklenskiy mining enterprise	Arpaklen deposit	10,000
Do.	Kumytash deposit and other deposits	NA	NA
Bench gravel and loam:			
Bench gravel	Bezmeinskiy deposit	Near Asgabat	1,200,000
Loam	do.	do.	12,000
Bischofite, epsomite, Caspian Sea salt, Glauber's salt	Karabogazsulfate Association	Kara-Bogaz-Gol Lagoon, off the Caspian Sea	NA
Bromine	Cheleken plant	Cheleken region	4,740
Do.	Nebitdag plant	Nebitdag region	2,370
Cement	Bakharlinskiy cement plant	South of Kelyata train station	1,000,000
Do.	Bezmeinskiy cement plant	Kelyata	1,400,000
Clays:			
Bentonite	Oglanly Mine	Oglanly region	100,000
Kaolin	Ashkhabad glass plant	Kyzylkainskoye deposit	80,000 e
Do.	Tuarkyrskoye deposit	250 kilometers southeast of Turkmenbashi	NA
Coal, oxidized	do.	do.	NA
Dolomite	Ashkhabad glass plant	Kelyatinskoye deposit	6,000 e
Gypsum	IA Turkmenmineral	Mukry, Tagorin deposits	300,000
Do.	Wastes from Gaurdak sulfur deposit	Gaurdak, Gora	400,000
Do.	Krasnovodsk Aylagy (anhydride) deposit	9 kilometers east of Turkmenbashi	160,000
Iodine	Cheleken plant	Cheleken region	355
Do.	Nebitdag plant	Nebitdag region	255 e
Limestone	Deposits:		NA
	Gaurdak	4 kilometers northeast of Gaurdak	
	Kara-Dzhumalakskoye	60 kilometers from Gaurdak	
Limestone, for facing materials	Charshanginskoye, Gaurdakskoye, Geok-Tepinskoye, Kaylyu, Krasnovodsk Aylagy (tuff and granite), and Tyuzmergenskoye deposits	NA	NA
Do. cubic meters	Tagarinskoye deposit	8 kilometers from Gaurdak	1,000 e
Limestone, for filling stone do.	Aeroport deposit	21 kilometers northeast of Turkmenbashi	2,000
Do. do.	Bekdashskoye deposit	200 kilometers north of Turkmenbashi	5,000
Do. do.	Dostluksoye deposit	230 kilometers southeast of Turkmenbashi	2,000
Do. do.	Mukrinskoye deposit	60 kilometers southwest of Gaurdak	25,000
Natural gas million cubic meters	Achakskoye, Dauletabad, Doviet-Denmez (Donmez), Gygyrlinskoye, Ioltan (South Yolotan-Osman), North and South Naipskiye, Shatlyk, and Yashlar deposits	Onshore in eastern and southwestern parts of the country and offshore in the Caspian Sea; Amu-Dar'ya and Murgab Basins; Dashoguzskiy, Lebapskiy, Maryyskiy deposits	90,000 e, 2
Ozokerite	Cheleken mining enterprise	Cheleken region	NA
Petroleum:			
Crude thousand metric tons	Barsa-Gelmesskoye, Burunskoye, Cheleken, Gograndagskoye, Ioltan (South Yolotan-Osman), Kamyshldzhinskoye, Korturtepinskoye, Kum Dag, Kuydzhikskoye, Okaremskoye, and Yashlar deposits	Centered in Caspian plain in west Turkmenistan and in offshore oilfields to the west of the Cheleken Peninsula in the Caspian Sea	11,000 e, 2
Refined do.	Refineries:		12,000 2
	Seydi oil refinery	Chardzhouskiy Rayon	
	Turkmenbashi complex of oil refineries	Turkmenbashi	

See footnotes at end of table.

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TABLE 2—Continued

TURKMENISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity
Potash (sylvinite, carnallite)		Karlyuk deposit (experimental mine closed 1998)	25 kilometers from Gaurdak	NA
Do.		Karabil'skoye deposit	17 kilometers south of Gaurdak	NA
Quartz sand		Annauskoye, Babadurmazskoye, Bakhardenskoye, and Kelyatinskoye deposits	NA	NA
Rock salt		Gaurdak deposit	8 kilometers from Gaurdak	15,000 e
Do.		Khodzhaguymaskoye deposit	4 kilometers west of Gaurdak	NA
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	2,000 e
Do.		Uzun-Kudukskoye deposit	20 kilometers from Gaurdak	2,000 e
Salt		Kuulinskoye	40 kilometers north of Turkmenbashi	650,000 e
Sand and gravel	cubic meters	Dushaksoye deposit	NA	1,150,000
Do.	do.	Kala-I-Morskoye deposit	NA	925,000
Do.	do.	Kernayskoye deposit	NA	36,000
Do.	do.	Kubatayskoye deposit	NA	740,000
Do.	do.	Ufrinskoye deposit	NA	900,000
Sodium sulfate		Karabogazsulfate Association	Bekdash, Kara-Bogaz-Gol Lagoon (off the Caspian Sea)	400,000
Strontium (celesite)		Arikskoye deposit (mining ceased 1992)	Near Gaurdak	NA
Do.		Shakhtaminskoye deposit	do.	NA
Sulfur		Darvaza, Segli-Kar, and Kara-Kum sulfur plants	Kara-kum deposit (mining ceased in 1962)	NA
Do.		Gaurdak plant	Gaurdak deposit (mining ceased in 1997)	500,000 e
Do.		IA Turkmenmineral	Gora deposit	340,000
Do.		Kugitangskoye deposit	75 kilometers from Gaurdak	NA

eEstimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

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The Mineral Industry of Ukraine

By Mark Brininstool

Ukraine was among the world's leading producers of a number of minerals. It was one of the world's top four producers of gallium, the fourth ranked producer of rutile (accounting for 9.8% of world output), the fifth ranked producer of titanium sponge (4.9% of world output), the sixth ranked producer of iron ore (3% of world output), the seventh ranked producer of manganese ore (4.4% of world output), the eighth ranked producer of pig iron (2.6% of world output) and steel (2.4% of world output), and the ninth ranked producer of ilmenite (5.2% of world output). The country had significant coal reserves but was dependent on imports to satisfy most of its petroleum and natural gas demand. Ukraine was also an important transit country for natural gas and petroleum from Central Asia and Russia to Europe (Corathers, 2011; Fenton, 2011; Gambogi, 2011a, b; Jaskula, 2011; Jorgenson, 2011; World Steel Association, 2011, p. 9).

Minerals in the National Economy

In 2010, Ukraine's gross domestic product (GDP) increased by 4.2% compared with that of 2009. The State Statistics Committee of Ukraine reported that, in 2010, mining and quarrying activities accounted for about 6% of the GDP, and manufacturing, 15%. The State Statistics Committee of Ukraine did not specify how much of the value added from manufacturing came from metals processing. In 2010, an average of 446,000 people were employed in the mining industry; 339,000 were employed in metallurgy and production of finished metal products; 114,000 were employed in the manufacturing of nonmetallic mineral products, and 39,000 were employed in the manufacturing of coke and refined petroleum products. Total industrial employment was about 2.8 million. A significant portion of those employed in the mineral industry were part of the coal industry, and the Coal Industry Workers' Union of Ukraine reported that as of January 1, 2011, about 300,000 of its members were listed as "working" members (Coal Industry Workers' Union of Ukraine, 2011; State Statistics Service of Ukraine, 2011b; 2011c, p. 372; 2011d).

Production

In 2010, production of mineral commodities generally increased owing to a recovery from the slowdown in economic activity in 2008 and 2009 that began as a result of the world financial crisis. Production of ferromanganese increased by 116%; feldspar, by 72%; manganese ore and concentrate, by 71%; sulfuric acid, by 46%; kaolin, by 42%; nitrogen, by 36%; ferrosilicon, by 30%; silicomanganese, by 27%; iron ore, by 18%; limestone, by 14%; and crude steel, by 12%. Production of aluminum decreased by 50%; kaolinitic clays, by 14%; peat, by 14%; crude petroleum, by 11% (table 1).

Mineral Trade

The total value of Ukraine's exports increased to about $51 billion in 2010 from $40 billion in 2009. Exports accounted for about 50% of Ukraine's GDP in 2010 compared with about 46% in 2009. Ukraine's leading export category in terms of value was ferrous metals, and in 2010, exports of ferrous metals were valued at $14.6 billion and made up 28% of the total value of exports; in 2009, the value of ferrous metals exports was about $10.2 billion and made up 26% of the total value of exports. The value of ferrous metal exports increased by about 43% compared with that of 2009 mainly owing to higher prices for ferrous metal product exports. The value of exports of mineral products and metals made up about 47% of the value of total exports (State Statistics Service of Ukraine, 2010a, b; 2011a, b; National Bank of Ukraine, 2011, p. 29).

The total value of Ukraine's imports was about $61 billion in 2010 and $45 billion in 2009. The leading import commodities were mineral fuels and refined petroleum products, which made up about 32% of the value of total imports in 2010. Natural gas was the leading individual import product in terms of value and accounted for 15.5% of the value of total imports. Ukraine consumed 51.9 billion cubic meters of natural gas in 2009 and 57.6 billion cubic meters in 2010, of which Ukraine purchased from Russia 37.8 billion cubic meters in 2009 and 36.5 billion cubic meters in 2010 (JSC Naftogaz of Ukraine, 2010, 2011; State Statistics Service of Ukraine, 2010a, 2011a; OAO Gazprom, 2011, p. 83).

Structure of the Mineral Industry

As in many of the countries that had made up the former Soviet Union, ownership and control of mineral production facilities in Ukraine were not always completely transparent, but understanding the ownership issues is important for understanding the actions of industry participants. According to news reports, Ukrainian companies or their owners often established holding companies outside of Ukraine in order to purchase mineral production facilities and control their activities through indirect ownership. Therefore, when discussing particular companies, it was common to refer to the companies as being "controlled by" instead of "owned by" another entity to avoid an unnecessarily detailed explanation of the ownership structure. This report and table 2 use this method to show the companies that actually control various facilities without showing specific shareholders.

A good example of this indirect method used to control mineral production facilities was the PrivatBank Group's control of Ukraine's manganese production and of virtually all Ukraine's ferroalloys production. The PrivatBank Group's control of Ukraine's two manganese mining companies at Marganets and Ordzhonikidze and three ferroalloys plants at

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Nikopol, Stakhanov, and Zaporozhye was widely reported, but the exact nature of ownership was difficult to determine. The shares of most of these facilities were owned by a number of privately held companies based in Cyprus that were widely reported to have been owned by the principle shareholders of PrivatBank, which gave the PrivatBank Group effective control over the facilities without having direct ownership of them (table 2; Ignatenko, 2009).

Another important aspect of the structure of the Ukrainian mineral industry was that major production facilities were often controlled by Ukrainian conglomerates with financial and industrial assets (known as financial-industrial groups). The leading Ukrainian financial-industrial group in terms of production of mineral commodities was System Capital Management Group (SCM Group), which controlled assets in a number of industries, including finance, media, power generation and distribution, real estate, and telecommunications in Ukraine. Through Metinvest B.V. (based in the Netherlands) and Donbass Fuel and Energy Co. (DTEK), SCM Group also held important mining and metals production facilities. In 2010, according to company reports, Metinvest accounted for 56% of iron ore production in Ukraine (46% of total production if Metinvest's total concentrate production of 35.7 million metric tons (Mt) is compared with Ukraine's reported total production of 78.1 Mt of marketable ore and concentrate), 41% of crude steel production (including total 2010 production at OJSC Ilyich Iron and Steel Works, which was acquired by Metinvest in November 2010), and about 28% of coke production. Metinvest and DTEK combined accounted for about about 33% of coal production in Ukraine (Donbass Fuel and Energy Co., 2011, p. 35; Metinvest B.V., 2011, p. 17, 42, 46–47; SCM Group, 2011, p. 24–25, 28).

Commodity Review

Metals

Aluminum.—In 2010, production decreased by one-half at United Company RUSAL's (RUSAL's) Zaporozhye smelter, which was Ukraine's only producer of primary aluminum. RUSAL reduced production at the plant because high production costs resulted in the plant operating at a financial loss. A major reason for the high production costs was the plant's electricity tariffs, which the company had tried unsuccessfully to reduce for a number of years. RUSAL was reportedly considering selling the plant owing to the inability of the company to obtain a more attractive price for electricity (RIA Novosti Ukraine, 2010).

Ferroalloys.—In response to a rapid increase in imports of relatively cheap foreign ferroalloys from a wide range of countries, including Georgia, India, Kazakhstan, the Republic of Korea, and Russia, the Ukrainian Association of Ferroalloys Producers (UkrFA) (a business group that represented all the major ferroalloys and manganese ore producers in Ukraine) requested that Ukraine's Interdepartmental Commission on International Trade (ICIT) undertake an antidumping investigation of Ukraine's ferroalloy imports. An investigation was launched in February, and in December, the ICIT announced that it found that ferroalloys were not imported in a quantity or under conditions that threatened to do significant harm to the domestic ferroalloys industry. Therefore, the ICIT closed the investigation and declined to recommend any tariffs on imports of ferroalloys. In its request for the investigation, UkrFA stated that from the third quarter of 2008 through the third quarter of 2009, imports of ferroalloys into Ukraine increased by 219% whereas demand for ferroalloys decreased by 59% (Ukrrudprom, 2010; 2011b).

The U.S. market was virtually closed to Ukrainian silicomanganese producers owing to an antidumping duty of 163% on silicomanganese imports from Ukraine that had been in effect in the United States since September 2001. At the end of 2010, UkrFA announced that it hoped to begin talks with the U.S. Department of Commerce about the possibility of using voluntary trade restrictions in place of the antidumping duty and to get a complete review of the duty in September 2011 (U.S. International Trade Commission, 2006, p. 3, I-8; Metall Ukrainy, 2010e, p. 55).

Iron and Steel.—According to the World Steel Association, Ukraine was the world's 8th ranked producer of steel and the 4th ranked exporter, following Japan, the European Union (EU), and Russia. In 2010, Ukraine exported about 24 Mt of steel, which was about 72% of the country's total steel production. Metinvest was the leading producer of crude steel in Ukraine and accounted for 41% of production if output for the entire year at OJSC Ilyich Iron and Steel Works, which was acquired by Metinvest in November 2010, is included. The iron and steel industry in Ukraine had the advantage of large domestic sources of iron ore but was dependent on export markets for product sales and operated inefficiently owing to a need for technical investment (table 1; Metall Ukrainy, 2011c, p. 6; Metinvest B.V., 2011, p. 17; World Steel Association, 2011, p. 9, 25).

In 2010, Ukraine produced 69% of its steel in oxygen converter furnaces, 26% in open hearth furnaces, and 5% in electric arc furnaces (EAF). Production of steel using open hearth furnaces is energy inefficient compared with oxygen converter or EAF production and takes place only in a few other countries, including Russia and India, which produced only 9.8% and 1.7%, respectively, of their steel in open hearth furnaces in 2010. In Ukraine, only 54% of steel in 2010 was produced through continuous casting, which was the lowest percentage of any country in the world (World Steel Association, 2011, p. 10–11).

Iron Ore.—In 2010, production of marketable iron ore and concentrate increased by about 18% compared with that of 2009 owing to a general economic recovery from the world economic crisis and an accompanying increase in demand for iron and steel products. An increase in international demand for iron ore products helped drive the increase in production, and in 2010, Ukraine's exports of iron ore products increased by 15% to 32.9 Mt. China was Ukraine's leading export market for iron ore products in the first 10 months of 2010 (trade data by country for all of 2010 were not available). From January through October, Ukraine exported 10.5 Mt of iron ore products to China, which accounted for about 39% of total iron ore product exports during that time period (Metall Ukrainy, 2010d, p. 45; 2011d, p. 50).

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Metinvest was the leading producer of iron ore and reportedly accounted for 56% of iron ore production in Ukraine. The company may have controlled an even higher percentage of domestic production because the reported figure presumably does not include Metinvest's share of production at Krivorozhskiy Iron Ore Complex. A total of of 1.9 billion metric tons (Gt) of Joint Ore Reserves Committee (JORC)-compliant reserves were reported by the company. Metinvest planned to be using all its iron ore production internally by 2020 while maintaining current production levels. In 2011, Metinvest planned to increase internal consumption to about 50% owing to the acquisition of the OJSC Ilyich Iron and Steel Works in November 2010, but increasing internal consumption to 100% would require a significant increase in iron and steel production capacity either through investment in current holdings or through acquisitions of additional steel production facilities (Metinvest B.V., 2011, p. 42, 44–45).

Manganese.—The Marganets mining and beneficiation complex (GOK) produced 736,600 metrict tons (t) of manganese concentrates and marketable ore in 2010 and the Ordzhonikidze GOK produced 852,700 t. Total manganese output increased by 71% compared with that of 2009 owing to a recovery in market demand for ferromanganese and silicomanganese by the steel industry. Imports of manganese ores and concentrates increased by 46.5% to 1.3 Mt and were valued at $637.78 million. The majority of domestically produced and imported manganese ores and concentrates was used to produce ferroalloys, and only about 121,190 t of manganese ores and concentrates (valued at $12.8 million) were exported from Ukraine in 2010. During the world economic crisis in 2008 and 2009, the Marganets and the Ordzhonikidze GOKs halted production from November 2008 until April 2009 owing to a lack of demand for manganese products, but in 2010, both facilities operated for the entire year (Metall Ukrainy, 2009, p. 44; 2010a, p. 44; 2011a, p. 43; 2011b, p. 43).

The undeveloped Velikotokmakskoye manganese deposit in Zaporizhia Oblast was reported to contain 1.5 Gt of manganese ore containing 25.8% manganese and to account for about 70% of known Ukrainian manganese reserves. (This reserve figure may actually refer to the amount of estimated resources, but not enough information is available to be certain.) Attempts to develop the deposit had been ongoing for at least a decade without any success. In 2010, it was reported that Hubei Changyang Hongxin Industrial Group Co., Ltd., of China was interested in investing $500 million in a project to develop part of the Velikotokmakskoye deposit by constructing a mining complex with a production capacity of 1 million metric tons per year of manganese ore and a manganese metal plant with a production capacity of 20,000 metric tons per year (t/yr). The development project would reportedly take about 10 years to complete, although it did not appear that any substantial work on the project was done in 2010, and there was not enough information to make realistic assumptions about the chances that the project would be completed (Gerasimova, 2010).

Titanium.—The titanium industry in Ukraine consisted of ilmenite and rutile concentrate production, titanium sponge production at the Government-owned Zaporozhye Titanium & Magnesium Combine (ZTMK), and titanium ingot production by a small number of producers, including OOO Antares, OOO Fiko, and ZTMK, that had a combined capacity to produce about 12,000 t/yr of titanium ingots. Titanium dioxide pigment was produced by Crimea Titan CJSC and OAO Sumykhimprom. Ukraine did not have the ability to produce titanium metal products used in the aerospace industry and other industries that require more technically advanced titanium metal products (Metall Ukrainy, 2010c, p. 61).

The dominant producers of ilmenite and rutile ores and concentrate were the Irshansk GOK and the Volnogorsk State Mining-Metals Complex; OOO Valki-Ilmenit also may have produced ilmenite concentrate but production data were not available, and table 1 shows only production from the Irshansk and the Volnogorsk operations. On October 29, Group DF (a company based in Vienna, Austria, but acting as a holding company for a Ukrainian businessman), announced that it had begun operations at the Mezhdurechensk GOK in Zhytomyr Oblast. According to a Group DF press release, the Mezhdurechensk GOK was likely eventually to reach a production capacity of 200,000 t/yr of ilmenite concentrate, but it was not clear if the Mezhdurechensk GOK produced any marketable products in 2010. A few exploration and development projects were reportedly ongoing in Ukraine (such as Velta LLC and TioFab Ltd.), but it was not known if or when production could be expected from any of these projects (Metall Ukrainy, 2010b, p. 60; Group DF, 2012).

In February 2009, the Cabinet of Ministers approved the formation of State Joint Stock Holding Co. (SJSHC) Titan Ukraine as a holding company for all the Government-controlled businesses related to the titanium industry. The company was to be vertically integrated and to oversee all aspects of titanium production in Ukraine. The realization of a vertically integrated company depended on the incorporation into Titan Ukraine of the Irshansk GOK and the Volnogorsk State Mining-Metals Complex, but although both facilities were Government owned, Crimea Titan CJSC held the lease for the operation of both of these facilities until September 2009. Crimea Titan was owned 50% plus one share by the Government and 50% minus one share by OstChem Holdings (which was part of Group DF), but OstChem Holdings was in control of Crimea Titan's operations and management. In 2009, when the Government refused to extend Crimea Titan's lease on the Irshansk and Volnogorsk mining facilities, Crimea Titan took the case to court to try to extend the lease and maintain control of the ilmenite and rutile production facilities because they provided Crimea Titan with an inexpensive source of titanium raw materials that were important for titanium dioxide pigment production. Throughout 2010, the case remained in the courts, and Crimea Titan continued to produce ilmenite and rutile at Irshansk and Volnogorsk but did not pay the Government for the use of the properties. The Government claimed that as of November 29, 2010, Crimea Titan owed about $8.6 million in rent and penalties for the use of the two properties, but Crimea Titan claimed that, according to previous court rulings, they did not need to pay for the use of the two properties. The legal dispute was not resolved in 2010 and continued into 2011 (Kommersant Ukraina, 2009; Ukrrudprom, 2011a).

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Uranium.—Ukraine's uranium reserves were estimated to be between 130,000 and 200,000 t, and the country was the ninth ranked producer of uranium in 2010. Nuclear powerplants in Ukraine accounted for 48% of all the electricity produced in the country, and domestic uranium production accounted for about 30% of all uranium used in Ukraine's nuclear powerplants. Uranium ore was produced in Ukraine by the state-owned company Vostochny GOK at underground mines and was processed into concentrate at the company's hydrometallurgical plant at Zheltye Vody. Ukrainian uranium concentrate was then sent to Russia to be processed by JSC TVEL of Russia into nuclear fuel for use in Ukraine; the remaining nuclear fuel required for Ukraine's nuclear powerplants was purchased from TVEL. In September, TVEL was awarded a contract for the construction of a nuclear fuel assembly plant in Ukraine, and production was planned to begin in 2014. The fuel assembly plant would allow Ukraine to execute the final stage of nuclear fuel preparation, but it would still be necessary for Ukraine to ship its uranium concentrate out of the country for the intermediate process of uranium conversion and enrichment (JSC TVEL, 2010; NNEGC Energoatom, 2011; World Nuclear Association, 2011a, b).

In June, Ukraine's nuclear power company, NNEGC Energoatom, and TVEL signed a long-term contract for the supply of nuclear fuel to Ukraine beginning in 2011. The details of the contract, including the length of the contract and the amount of nuclear fuel to be supplied, were reportedly undisclosed owing to a confidentiality agreement signed by the two companies. Through 2010, TVEL was the only supplier of nuclear fuel to Ukraine, but Energoatom was examining ways to reduce its dependence on TVEL and was considering Westinghouse Electric Co. as a possible alternative source of nuclear fuel. In 2010, Westinghouse provided Energoatom with 42 fuel assemblies to be tested in the nuclear powerplant in Mykolaiv. Energoatom hoped that if the test was successful, it would be able to purchase nuclear fuel from Westinghouse beginning in 2011, but it appeared that Energoatom would need the approval of the State Nuclear Regulatory Committee of Ukraine before any fuel purchase could take place (Gavrish, 2010; Interfax-Ukraine, 2010; Stack, 2010).

In September, the General Manager of the Vostochny GOK stated that the company planned to begin uranium production at the Novokonstantinovskoye deposit in Kirovohrad Oblast in 2011 and at the Safonovskoye deposit in Mykolaiv Oblast in 2012. The Vostochny GOK expected production at the Novokonstantinovskoye deposit to begin at a few hundred metric tons but to reach 1,000 t/yr in 2014. At the Safonovskoye deposit, production was expected to be 5 t in 2012, 50 t in 2013, and to reach production capacity of 150 t/yr in 2014. The Vostochny GOK expected total production of uranium in Ukraine to be about 1,000 t in 2011; slightly less in 2012 and 2013 owing to reduced production from the Ingulskaya and the Smolinskaya Mines; 2,100 t in 2014 owing to increased production at the Novokonstantinovskoye deposit, and from 2017 onward, about 3,500 t/yr. The level of production planned for 2017 would allow Ukraine to supply 100% of the uranium needs of the domestic nuclear powerplants (RBK-Ukraine, 2010).

Outlook

Ferrous metallurgy will most likely continue to be Ukraine's most important sector of the mineral industry. Investment in the metallurgy sector could improve the competitiveness of Ukrainian production (especially in the iron and steel industry), but it is difficult to say whether or not these investments will be made. Exports will in all likelihood remain important for sales of Ukraine's ferrous metallurgy products, and demand in foreign markets could be the most important determinant of domestic production. It also remains to be seen whether Ukraine will be able to increase its production of coal and uranium to increase the security of its resources for electricity production, given that past efforts to increase the production of mineral fuels have suffered from a lack of funding or faced other problems that have impeded resource development.

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TABLE 1

UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Alumina		1,671,620	1,700,000 e	1,673,000	1,524,000	1,534,000
Aluminum:						
Primary		112,961	113,437	113,000	50,000	25,000
Secondary e		130,000	130,000	130,000	130,000	130,000
Total e		243,000	243,000	243,000	180,000	155,000
Cadmium, metal e		25	25	25	25	25
Copper, metal, secondary e		20,000	20,000	20,000	20,000	20,000
Gallium e		13	13	13	13	13
Germanium e	kilograms	1,000	1,000	1,032 [3]	690 [3]	700
Gold, mine output, Au content e	do.	120	--	--	--	--
Iron and steel:						
Iron ore, marketable ore and concentrate:						
Gross weight		74,000,000	77,900,000	72,688,000	66,476,000	78,170,700
Fe content e		40,700,000	42,800,000	40,000,000	36,600,000	43,000,000
Metal:						
Pig iron		32,926,000	35,647,000	30,982,000	25,682,900	27,361,000
Ferroalloys:						
Blast furnace: e						
Ferromanganese		26,700	28,400	16,000	--	--
Spiegeleisen		4,450	4,730	2,000	--	--
Electric furnace:						
Ferromanganese		373,000	368,000	362,400 [4]	129,400 [4]	280,100 [4]
Ferronickel		79,338	79,530	89,825	61,449	62,000 e
Ferrosilicon		169,000	218,000	152,800 [4]	150,300 [4]	195,500 [4]
Silicomanganese		1,168,000	1,281,000	894,900 [4]	741,900 [4]	940,400 [4]
Other e		22,200	23,700	23,000	23,900 r	28,500
Total, blast and electric furnaces e		1,840,000	2,000,000	1,540,000	1,110,000 r	1,510,000
Steel:						
Crude		40,891,000	42,830,000	37,279,000	29,855,000	33,559,000
Finished products:						
Rolled		22,387,000	24,510,000	20,493,000	16,097,600	17,549,300
Pipe		2,759,000	2,811,000	2,542,000	1,742,000	1,928,400
Lead, refined, secondary e		7,000	7,000	7,000	7,000	7,000
Magnesium metal e, [5]		2,200	2,500	2,000	2,000	2,000
Manganese, marketable ore and concentrate:						
Gross weight		1,606,400	1,719,600	1,446,600 [4]	932,000 [4]	1,589,300 [4]
Mn content e		546,000	580,000	492,000	317,000 r	540,000
Manganese, metal [4]		NA	14,578	8,585	14,330	16,137
Nickel:						
Mine output, Ni content of laterite ore e		12,000	12,000	8,000	--	--
Ni content of ferronickel		15,223	14,211	16,224	12,392	12,400 e
Titanium:						
Ilmenite concentrate: e, [6]						
Gross weight		470,000	500,000	520,000	500,000	500,000
TiO_2 content, 59%		276,000	294,000	306,000	295,000	295,000
Rutile concentrate, 95% TiO_2 e		60,000	60,000	60,000	60,000	60,000
Metal, sponge e		9,100	9,740 r	9,930	6,830 r	7,400
Zirconium concentrates e, [7]		27,000 r	37,000 r	36,000 r	31,000 r	30,000
INDUSTRIAL MINERALS						
Bromine		5,150	7,824	4,416	4,121	4,100
Cement		13,732,000	15,000,000	14,918,400	9,495,700	9,456,500

See footnotes at end of table.

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TABLE 1—Continued

UKRAINE: PRODUCTION OF MINERAL COMMODITIES[1, 2]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Clays:						
Ball clay		294,000	652,000	650,000 e	600,000 e	600,000 e
Bentonite e		300,000	300,000	200,000	195,000	185,000
Kaolin	thousand metric tons	1,300 r, e	1,735 r	1,457 r	764 r	1,085
Kaolinitic clays	do.	430 e	437	318	354	306
Diamond, synthetic		NA r	NA r	NA r	NA r	NA
Feldspar		67,313	76,305	83,420	84,757	146,000
Graphite e		5,800	5,800	5,800	5,500	6,000 e
Gypsum		375,900	741,580	1,158,000	711,000	679,000
Lime	thousand metric tons	5,450	5,688	5,128	4,101	4,220
Limestone	do.	27,800	30,000	26,700	18,000	20,600
Nitrogen, N content of ammonia e	do.	4,200	4,200	4,000	2,500	3,400
Potash, K_2O equivalent e, 8		-- r	-- r	-- r	-- r	--
Salt		5,996,000	5,548,000	4,425,000	5,395,000	4,908,000
Soda ash		950,000 r, e	950,000 r, e	977,800 r	680,000 r	706,700
Sulfur, native e		133,000	135,000	135,000	120,000	130,000
Sulfuric acid	thousand metric tons	1,493	1,657	1,479	890	1,296
Vermiculite e		65,000	65,000	65,000	55,000	60,000
MINERAL FUELS AND RELATED MATERIALS						
Coal, raw: e						
Anthracite	thousand metric tons	13,444 3	13,000	14,000	13,000	14,000
Bituminous	do.	66,600 3	62,255 3	63,400	59,000	61,000
Lignite	do.	231 3	182 3	200	200	200
Total	do.	80,275 3	75,400	77,600	72,200	75,200
Marketable 3	do.	61,439	58,739	59,312	54,820	54,444
Coke		19,200,000	20,143,000	19,543,000	17,424,000	18,599,700
Natural gas 9	thousand cubic meters	21,062,000 r	21,150,000 r	21,467,000 r	21,545,000 r	20,458,000
Peat:						
Fuel use		462,000	395,000	358,000	449,000	430,000
Horticultural use		200,000 e	200,000 e	200,000 e	242,000	167,000
Total		662,000 r, e	595,000 r, e	558,000 r, e	691,000 r	597,000
Petroleum: e						
Crude and gas condensate 10	42-gallon barrels	32,800,000	32,400,000	30,300,000	28,500,000	25,400,000
Refinery products 11	do.	104,000,000	103,000,000	83,700,000	85,700,000	80,300,000
Uranium: e						
U content		800	800	830	830	850
U_3O_8 content		940	940	980	980	1,000

eEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. rRevised. do. Ditto.

NA Not available. -- Zero.

[1]Table includes data available through January 25, 2012.

[2]In addition to the commodities listed, other minerals may be produced, but available information was inadequate to make reliable estimates of output.

[3]Reported figure.

[4]Data provided by the Ukrainian Association of Ferroalloy Producers (UkrFA).

[5]Includes secondary production.

[6]Ilmenite production statistics include information from production at only the Irshansk GOK and Volnogorsk State Mining-Metals Complex. Production data for OOO Valki-Ilmenit were not available, but it may produce an additional 50,000 metric tons per year of ilmenite concentrate.

[7]Zirconium concentrates production estimates are based on reported exports.

[8]Potash has not been produced in Ukraine since 2003 when the Government-owned company Polymineral halted production.

[9]The data series for natural gas production was revised to reflect natural gas production as reported by the State Statistics Service of Ukraine.

[10]Figures were converted to barrels from metric tons (t), which were reported as follows: 2006—4,506,000 t; 2007—4,459,000 t; 2008—4,168,300 t; 2009—3,916,600 t; and 2010—4,149,000 t.

[11]Figures were converted to barrels from metric tons (t), which were reported as follows: 2006—13,525,000 t; 2007—13,283,000 t; 2008—10,717,000 t; 2009—10,959,000 t; and 2010—10,333,000 t.

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TABLE 2

UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[2]	Location or deposit names	Annual capacity[e]
Alumina and aluminum:			
Alumina	Nikolaev alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	1,570,000
Do.	Zaporozhye refinery [United Company RUSAL (RUSAL)]	Zaporizhia	260,000
Aluminum, primary	Zaporozhye smelter [United Company RUSAL (RUSAL)]	do.	114,000
Coal	About 165 active surface and underground mines, including:	About 95% of coal produced in Donetsk, Dnipropetrovsk, and Luhansk Oblasts	90,300,000 [3]
	Donbass Fuel and Energy Co. (DTEK) (System Capital Management, 100%):		
	OAO Pavlogradugol	10 mines in Dnipropetrovsk and Donetsk Oblasts	
	OAO Komsomolets Donbassa Mine	Kirovskoe, Donetsk Oblast	
	State Enterprise Sverdlovskanthracite	5 coal mines and 3 processing plants in Luhansk Oblast	
	State Enterprise Rovenkianthracite	6 mines and 3 processing plants in Luhansk Oblast	
	Krasnoarmeiskaya-Zapadnaya No. 1	1 mine at Krasnoarmeisk, Donetsk Oblast	
	JSC Krasnodon Coal Co. (Metinvest B.V.)	7 mines and 2 processing plants in Luhansk Oblast	
	Approximately 28 smaller producers	Donetsk, Dnipropetrovsk, Luhansk, Lviv, and Volynsk Oblasts	
Coke	Evraz Group:	Dnipropetrovsk Oblast:	3,000,000
	OAO Dneprkoks coke plant	Dnipropetrovsk	
	OAO Bagliykoks coke plant	Dniprodzerzhinsk	
	OAO Dneprodzerzhinsk coke plant	do.	
Do.	Metinvest B.V.:		
	JSC Avdiivka Coke Plant	Avdeyevka, Donetsk Oblast	4,000,000
Do.	JSC Azovstal Iron and Steel Works	Mariupol, Donetsk Oblast	3,182,000
Do.	OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovsk Oblast	3,300,000
Do.	JSC Donetskkoks[4] (Metinvest B.V., 37.46%)	Donetsk, Donetsk Oblast	492,000
Do.	Yenakievo Coke Plant	Yenakievo, Donetsk Oblast	NA
Do.	OAO Zaporozhkoks (Metinvest B.V., 25%)	Zaporizhia	NA
Do.	Makeevka Coke Plant	Makeevka, Donetsk Oblast	NA
Do.	OAO Yasinovskiy Coke Plant	do.	NA
Do.	OAO Alchevsk Coking Plant [Industrial Union of Donbass (ISD Corp.)]	Alchevsk, Luhansk Oblast	3,600,000
Do.	Horlivka Coke Plant	Horlivka, Donetsk Oblast	440,000
Do.	Kharkov Coke Plant	Kharkov	225,000
Ferroalloys:			
Ferromanganese	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000
Do.	Nikopol ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	300,000
Do.	Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Ferromanganese, blast furnace	Konstantinovka Iron and Steel Works	Konstyantynivka, Donetsk Oblast	NA [5]
Do.	Kramatorskiy Metal Plant "Kuibiysheva"	Kramatorsk, Donetsk Oblast	NA [6]
Ferronickel	Pobuzhskiy Ferronickel Plant	Pobuzhke, Kirovohrad Oblast	100,000
Ferrosilicon	Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Do.	Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	100,000

See footnotes at end of table.

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TABLE 2—Continued

UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners[2]	Location or deposit names	Annual capacity[e]
Ferroalloys—Continued:				
Silicomanganese		Stakhanov ferroalloys plant (PrivatBank Group)	Luhansk Oblast	NA
Do.		Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	250,000
Do.		Nikopol ferroalloys plant (PrivatBank Group and EastOne Group)	Nikopol	900,000
Gallium		Nikolaev alumina refinery [United Company RUSAL (RUSAL)]	20 kilometers south of Mykolaiv	13
Germanium		Zaporozhye titanium-magnesium plant	Zaporizhia	19,000
Graphite		Zavalyevskiy graphite complex	Zavalyevskiy deposit	NA
Iron ore:				
Underground mining		Krivorozhskiy Iron Ore Complex (Metinvest B.V., 50%, and PrivatBank Group, 50%)	4 mines, in Kryvorizkiy iron ore basin	7,000,000
Do.		Sukha Balka (Evraz Group)	2 mines in Dnipropetrovsk Oblast	3,100,000
Do.		PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	1,500,000
Do.		Zaporozhye Iron Ore Complex	Eksplutatsionnay Mine in Zaporizhia Oblast	4,500,000
Do.		JSC Central Iron Ore Enrichment Works (Metinvest B.V.)	1 mine in Dnipropetrovsk Oblast	2,200,000
Open pit mining		do.	3 mines in Dnipropetrovsk Oblast	12,000,000
Do.		JSC Northern Iron Ore Enrichment Works (Metinvest B.V.)	2 mines in Dnipropetrovsk Oblast	30,000,000
Do.		JSC Ingulets Iron Ore Enrichment Works (Metinvest B.V.)	Ingulets mine south of Kryviy Rih	35,000,000
Do.		Yuzhniy GOK (Evraz Holding, 50%, and Smart Holding, 50%)	Mine at Kryviy Rih	22,000,000
Do.		PJSC ArcelorMittal Kryviy Rih	2 mines at Kryviy Rih	24,200,000
Do.		Poltava GOK (Ferrexpo Plc)	Gorishne-Plavninskoye and Lavrikovskoye (GPL) Mine 15 kilometers east of Kremenchug	28,500,000
Lead, secondary		CJSC Svinets	Kostyantynivka	20,000
Magnesium metal		Magnii concern	Kalush	22,000
Manganese:				
Ore, marketable		Ordzhonikidze GOK (PrivatBank Group)	Ordzhonikidze	NA
Do.		Marganets GOK (PrivatBank Group)	Marhanets	NA
Metal		Zaporozhye ferroalloys plant (PrivatBank Group)	Zaporizhia	NA
Mercury		OOO Nikitrtyt	Horlivka, Donetsk Oblast	300
Nickel, Ni content in FeNi		Pobuzhskiy GOK, composed of three open pit mines and the Pobuzhskiy Ferronickel Plant	Pobuzhke, Kirovohrad Oblast	20,000
Petroleum, refined	42-gallon barrels	Kherson oil refining plant	Kherson	NA
Do.	do.	Odessa refinery (OAO Lukoil)	Odessa	23,000,000
Do.	do.	Lisichansk refinery (TNK-BP)	Lisichansk	52,600,000
Do.	do.	Halychyna refinery (Ukraine Oil Co.)	Drohobych, Lviv Oblast	28,600,000
Do.	do.	Kremenchug refinery (CJSC Ukrtatnafta)	Kremenchug	150,000,000
Do.	do.	JSC Naftokhimik Prykarpattya	Nadvirna, Ivano-Frankivsk Oblast	18,400,000
Steel, crude		Industrial Union of Donbass Corp. (ISD Corp.):		
		OJSC Alchevsk Iron and Steel Works	Alchevsk, Lugansk Oblast	NA
Do.		Dneprovskiy Metallurgical Plant "Dzerzhinsky"	Dniprodzerzhinsk	3,850,000
Do.		Metinvest B.V.:		
		JSC Azovstal Iron and Steel Works	Mariupol, Donetsk Oblast	6,200,000
Do.		JSC Yenakievo Iron and Steel Works	Yenakievo, Donetsk Oblast	2,700,000
Do.		OJSC Ilyich Iron and Steel Works	Mariupol	6,000,000
Do.		OJSC ArcelorMittal Kryviy Rih	Kryviy Rih, Dnipropetrovsk Oblast	7,400,000
Do.		Dnepropetrovsk Metal Plant "Petrovskovo" (DMZP) (Evraz Group S.A., 96%)	Dnipropetrovsk	1,360,000

See footnotes at end of table.

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TABLE 2—Continued

UKRAINE: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners[2]	Location or deposit names	Annual capacity[e]
Steel, crude—Continued	JSC Zaporizhstal	Zaporizhia	4,350,000
Do.	Kramatorskiy Metal Plant "Kuibiysheva"	Kramatorsk, Donetsk Oblast	NA
Do.	Donetskstal	Donetsk	1,150,000
Do.	Donetsk Electrometallurgical Plant (formerly ISTIL minimill)	do.	1,000,000
Do.	Dneprospetsstal	Zaporizhia	1,400,000
Do.	OOO Elektrostal	Kurakhovo, Donetsk Oblast	300,000
Do.	JSC Energomashspetsstal	Kramatorsk, Donetsk Oblast	NA
Titanium:			
Concentrate:			
Ilmenite	Irshansk GOK [Leased from the Government by Crimea Titan CJSC (Government, 50% plus one share, and OstChem Gmbh, 50% minus one share)]	Irshansk, 50 kilometers north of Zhytomyr	400
Do.	OOO Valki-Ilmenit	do.	70
Do.	Mezhdurechensk GOK (Group DF)	Zhytomyr Oblast	NA
Do.	Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukrainian Government, 50% plus one share, and OstChem Gmbh, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	200
Rutile	do.	do.	65
Sponge	Zaporozhye Titanium & Magnesium Combine (ZTMK) (Government)	Zaporizhia	20,000
Uranium:			
Ore thousand metric tons	Vostochny GOK (Government)	Ingulskaya Mine at Kirovohrad	450
Do. do.	do.	Smolinskaya Mine at Smolino	600
Concentrate	do.	Hydrometallurgical concentration plant at Zheltye Vody	1,000
Zinc, secondary	Ukrzinc plant	Kostyantynivka	25,000
Zirconium:			
Concentrate	Volnogorsk state mining-metals complex [Leased from the Government by Crimea Titan CJSC (Ukrainian Government, 50% plus one share, and OstChem Gmbh, 50% minus one share)]	Volnogorsk, 70 kilometers west of Dnipropetrovsk	35
Metal and compounds	State Research and Production Enterprise "Zirconium"	Dniprodzerzhinsk	NA

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Inconsistencies in enterprise and location names may exist because Ukrainian and Russian spellings were used for transliterations. English versions of company names are used as given by official company sources (Web sites, press releases, and so forth). Ukrainian versions of location names are used wherever possible.

[2]GOK is the abbreviation for gorno-obogotitelniy kombinat, which translates as 'mining and beneficiation complex'.

[3]Capacity estimates are totals for all enterprises that produce that commodity.

[4]Identified as OAO Donetsk coke plant in the 2009 Minerals Yearbook.

[5]Konstantinovka Iron and Steel Works stopped production of blast furnace ferromanganese in 2008.

[6]Kramatorskiy Metal Plant "Kuibiysheva" stopped production of blast furnace ferromanganese in 2006.

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The Mineral Industry of the United Kingdom

By Alberto Alexander Perez

In 2010, the United Kingdom's economy was ranked second after Germany's within the European Union (EU) in terms of the gross domestic product (GDP) based on purchasing power parity. The United Kingdom's GDP, in 2010 dollars, was $2.173 trillion, which was a 1.3% increase compared with that of 2009. The country's heavy industry, which was composed of companies that produced automotive and aviation products, chemicals, and machine tools, among others, relied heavily on imported metal ores and concentrates, as well as on some industrial minerals and mineral fuels. The mineral fuels sector, which included coal, natural gas, and petroleum, formed a significant segment of the United Kingdom's mineral industry. In 2009, the country accounted for about 1.3% of the world's refined nickel production, and in 2010, the United Kingdom produced 1.2% of the world's crude salt output and 1.2% of the world's potash production.

In 2010, the United Kingdom's industrial production increased by 2.1% compared with that of 2009; the total output of its mining and quarrying sector decreased by 4.7% compared with that of 2009, and the output of base-metal and metal products increased by 7.1%. These changes reflect the uneven economic recovery of the global markets, which affected the United Kingdom directly because it was a major regional processor of raw mineral materials and a manufacturer and producer of consumer durables and production was sensitive to changes in global demand (Jasinski, 2011; Kostick, 2011; Kuck, 2011; Office for National Statistics, 2011a, p. 49–54; U.S. Central Intelligence Agency, 2011).

Minerals in the National Economy

The United Kingdom's mineral sector served domestic economic needs, but the mining and processing companies also played an important role in global mineral prospecting, mineral development, and mineral commodity trade. The London Metal Exchange remained the world's leading central market for nonferrous metals.

Government Policies and Programs

The 1971 Minerals Act, as amended, is the statute that governs the development and exploitation of mineral deposits. Minerals, as defined in Section 209 of the Act, include all minerals and materials in or under the land of a kind ordinarily worked for removal by underground or surface workings; they do not, however, include peat cut for purposes other than for sale. Mineral development is specifically addressed in the Town and Country Planning (Minerals) Regulations, 1971, and the Town and Country Planning (Minerals) Act, 1981. Mineral rights to mineral fuels, such as coal, petroleum, and uranium, belong to the state. The Coal Authority is authorized to license open pit and underground mines to the private sector subject to restrictions on their size and the payment of a royalty on the amount of coal produced.

Most other mineral rights in England, Scotland, and Wales are privately owned with the exceptions of gold and silver, which are vested in the Royal Family. A different situation regarding mineral rights applies to Northern Ireland where, under the Mineral Development Act (Northern Ireland), 1969, the rights to work minerals and to license others to do so are vested in the state.

The Government of the United Kingdom had ratified the Kyoto Protocol. The EU, however, decided to meet Kyoto requirements as a whole, rather than as individual signatories, with each member state given a different emissions target by the EU (British Geological Survey, 2010a).

Production

The production of most minerals decreased in 2010 compared with their output levels in 2009. A decrease was posted for the third year in a row for crude steel production, which decreased by 3.6%; there were also significant decreases in the production of primary aluminum (26.4%) and pig iron (5.7%) compared with their 2009 levels of production. These decreases in production, just as with 2009, were a consequence of the idling of plants and production reductions owing to the world economic slowdown and weak demand. In the industrial minerals sector, barite production decreased by 8.3% whereas cement production remained stable. In 2010, the United Kingdom's total production of aluminum decreased by almost 8% despite of an increase of 8% in the production of secondary aluminum. The production levels for coal and coke remained about the same as in 2009. Natural gas production decreased by an estimated 13%, and crude petroleum production decreased by 11.1%, which continued the trend of decreasing production since at least the past 6 years (table 1).

Structure of the Mineral Industry

Domestic and foreign-owned corporations produced minerals and mineral-based commodities. Table 2 is a list of major mineral industry facilities.

Mineral Trade

The United Kingdom was a net importer of iron and steel, coal, natural gas, crude petroleum, and petroleum products in 2010. It exported metal ores valued at $6.42 billion.[1] The value of the country's iron and steel and nonferrous metals exports were $7.9 billion and $9.1 billion, respectively. The United Kingdom became a net importer of natural gas in 2004,

[1]Where necessary, values have been converted from the British pound sterling (£) to U.S. dollars (US$) at the average rate of £0.54=US$1.00 and from the euro area euros (€) to US$ at the average rate of €0.680=US$1.00 for 2010.

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of crude petroleum in 2005, and of refined petroleum products in 2006 after many years of self-sufficiency (Office for National Statistics, 2011b, p. 22, 34, 40).

Commodity Review

Metals

Gold.—The number of licenses for exploration and development of gold mines in the United Kingdom decreased in 2009 (the latest year for which information was available) from 32 to 24 because eight licenses were relinquished in Northern Ireland. The number of leases remained constant at four. Exploration continued at Cononish in Perthshire County, Scotland, and in Omagh and Armagh in Northern Ireland. In Scotland, Scotgold Resources plc of Australia had licenses from Mines Royal (the licence granting authority in the United Kingdom) for the areas around Glen Lyon, Glen Orchy, and Inverliever, and the company owned the gold and silver assets of the Cononish deposit near Tyndrum.

In Northern Ireland, the Omagh (formerly Cavanacaw) deposit located 10 kilometers (km) southwest of the town of Omagh was owned by Omagh Minerals Ltd., which was a wholly owned subsidiary of Galantas Gold Corp. of Canada. The deposit had a proven and probable reserve of 367,310 metric tons grading 7.52 grams per metric ton gold across a width of 4.43 meters within the designated open pit area. Galantas had been granted exploration licenses to the west and north of its existing license and currently held licenses for an area totaling 460 square kilometers.

Conroy Diamonds and Gold plc was exploring in the Clontibret district. The district is located on the border of Northern Ireland and the Republic of Ireland near Co. Monaghan (British Geological Survey, 2010b, p. 49–50).

Nickel.—Alba Mineral Resources plc relinquished its four exploration licenses in the Aberfeldy area in Perthshire County, Scotland. This area covers Arthrath, Kilmelford and part of the Ochil Hills (British Geological Survey, 2010b, p. 73).

Industrial Minerals

The United Kingdom remained a significant producer of such minerals as barite and calcareous material for cement, clays, and fluorspar.

Barite.—The United Kingdom's barite production had been decreasing since 2005. Production was dominated by M–I Drilling Fluids (UK) Ltd., which operated the underground Foss Mine near Aberfeldy in Perthshire, Scotland. The production of this mine accounted for most of the production in the United Kingdom; the remaining output of barite was confined to the Southern Pennine Orefield where barites were derived as a byproduct of fluorspar mining (British Geological Survey, 2010b, p. 25).

Fluorspar.—Glebe Mines Ltd. was the United Kingdom's only domestic producer of fluorspar (calcium fluorite), and it supplied the country's two fluorochemical producers with acid-grade fluorspar. Glebe's operations were based on surface extraction and processing in the Southern Pennine Orefield. Glebe operated the Cavendish Mill near Stoney Middleton to produce acid-grade fluorspar, together with byproduct barite and lead concentrate. In October 2009, Glebe Mines' ore reserves were estimated to be about 1.2 million metric tons. In 2009, Glebe Mines was fined more than $61,000 for the damage caused by the failure of one of the mine's tailings dams in 2007, which resulted in flooding and waste discharge into surrounding areas and the nearby village of Stoney Middleton (British Geological Survey, 2010b, p. 48).

Iron and Steel.—Tata Steel Europe (formerly the Corus Group) mothballed the Teeside cast products works in February. As a result, 1,600 workers were slated to be laid off (Independent, The, 2010).

Mineral Fuels

Coal.—Coal production in the United Kingdom increased slightly in 2010, making it 3 years in a row that an increase in production had been achieved against the long-term trend of production decreases. In 2009 (the latest year for which information was available), Coal Authority licenses for opencast sites in production totaled 35 and included 19 in Scotland, 9 in England, and 7 in Wales. Scottish Coal Co. Ltd. was the leading opencast coal mining company in the United Kingdom and the second ranked net coal producer (British Geological Survey, 2010b, p. 33).

The generation of electricity accounted for the majority of the country's total coal consumption. About one-third of all electricity generated in the United Kingdom was supplied by coal (British Geological Survey, 2010b, p. 33).

Natural Gas and Petroleum.—In September 2010, Egdon Resources p.l.c. received approval to redevelop the gasfield situated onshore in Kirkleathan, North Yorkshire (British Geological Survey, 2011, p. 75).

Maersk Oil UK Ltd. (Maersk) began production in January at its Lochranza oilfield, which had been developed by Maersk next to the Dumbarton field in the United Kingdom's sector of the North Sea about 255 km northeast of Aberdeen. Maersk announced in August that it had produced first oil from its Affleck field in the United Kingdom's sector of the North Sea (British Geological Survey, 2011, p. 75).

The Buzzard oilfield in the outer Moray Firth was again the most prolific oilfield on the United Kingdom Continental Shelf (UKCS). The North Sea holds Europe's largest natural gas and petroleum reserves. At the end of 2009, the United Kingdom's estimated proven crude oil reserves totaled 3.6 billion barrels, which was the largest within the EU; the reserves were located mostly offshore on the UKCS. Most of the country's production had come from basins located east of Scotland in the central North Sea. The northern North Sea, east of the Shetland Islands, also contains considerable reserves, and smaller deposits are located in the North Atlantic Ocean. Besides these offshore assets, the country had the Wytch Farm field, which was the largest onshore oilfield in Europe (British Geological Survey, 2010b, p. 75; U.S. Energy Information Administration, 2010).

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Outlook

The United Kingdom's productive capacity continues to decrease, but the country is likely to continue to be a leading European producer of crude oil and refined products, although mostly for its own consumption. Onshore exploration activities will likely continue to be directed toward gold and mixed sulfide ores, particularly in Northern Ireland. Offshore natural gas and petroleum exploration and site development is expected to continue to be focused in the North Sea, The steel industry's recovery is likely to follow international trends, and as demand increases, it is possible that the mothballed and reduced-capacity plants in existence today will be reactivated. Aluminum production will likely remain flat owing to the relationship between prices and the relative high cost of electricity for its production.

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TABLE I

UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum, metal:						
Primary		360,300	364,600	326,000	253,000	186,000
Secondary		204,200	193,900	205,200	288,397	311,741
Total		564,500	558,500	531,200	541,397	497,741
Iron and steel:						
Iron ore and concentrate, manganiferous:						
Gross weight		350 e	300	100	--	--
Fe content, 54% Fe		195 e	162	54	--	--
Metal:						
Pig iron	thousand metric tons	10,696	10,960	10,137	7,671	7,233
Steel:						
Crude	do.	13,931	14,300	13,500	10,079	9,709
Hot-rolled	do.	10,757	10,170	9,517	7,091	8,395
Lead:						
Mine output, Pb content[e]		400	300	300	300 r	300 e
Metal:						
Smelter, bullion from imported concentrate		36,000	36,000	36,000	36,000	36,000
Refined:						
Primary[2]		174,700	119,000	139,000	135,000 e	150,000 e
Secondary[3]		144,000	144,000	144,000	144,000 e	144,000 e
Total		318,700	263,000	283,000	279,000 e	294,000 e
Nickel, metal[4]		36,800	34,100	41,000	17,800 r	17,800 e
INDUSTRIAL MINERALS						
Barite[5]		48,000	53,000	43,000	36,000 e	33,000
Cement, hydraulic	thousand metric tons	11,400	11,890	10,071	10,000 e	10,000 e
Clays:						
Fire clay[e]	do.	228	338 [6]	180	129	150
Kaolin, china clay[7]	do.	1,900	1,671	1,355	1,060 e	900
Ball clay and pottery clay[e, 8]	do.	1,000	1,022 [6]	1,020	727	1,000
Other, including shale	do.	10,432	10,104	8,459	5,310 r, e	4,721
Feldspar, china stone[e]		2,000	1,000	500	400 r	500
Fluorspar, all grades[e, 9]		50,000	45,000	37,000	19,000	26,000
Gypsum and anhydrite[e]	thousand metric tons	1,700	1,700	1,700	1,700	1,700
Lime, hydrated and quicklime[e]	do.	1,500	1,500	1,500	1,500	1,500
Nitrogen, N content of ammonia[e]	do.	1,100	1,100	1,100	1,100	1,100
Potash, KCL product		716,000	712,000	673,000	673,000 r, e	600,000
Salt:[e]						
Rock	thousand metric tons	2,000	2,000	2,000	2,000	2,000
From brine	do.	1,000	1,000	1,000	1,000	1,000
In brine, sold or used as such	do.	2,800	2,800	2,800	2,800	2,800
Sand and gravel, common sand and gravel	do.	92,107	93,236	85,473	65,800	66,800
Sodium compounds, carbonate, n.e.s.[e, 10]	do.	1,000	1,000	1,000	1,000	1,000
Stone:						
Chalk	do.	7,376	7,566	5,874	4,047 r	4,000 e
Dolomite	do.	12,101	7,622	5,509	3,164 r	3,000 e
Igneous rock	do.	53,954	58,909	53,489	44,618 r	44,000 e
Limestone	do.	80,228	83,491	74,143	60,111 r	60,000 e
Sandstone	do.	18,038	16,806	12,255	12,335 r	12,000 e
Slate, including fill	do.	865	1,428	1,058	683 r	600 e
Total	do.	172,562	175,822	152,328	124,958 r	124,000 e

See footnotes at end of table.

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TABLE 1—Continued

UNITED KINGDOM: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
INDUSTRIAL MINERALS—Continued						
Talc, soapstone, pyrophyllite		4,000	3,000	2,000	3,000	3,000
Titanium, titanium dioxide[e]	thousand metric tons	200	200	200	200	200
MINERAL FUELS AND RELATED MATERIALS						
Coal, anthracite and bituminous	thousand metric tons	20,000 [e]	17,030	17,912	18,054	18,159
Coke:[e]						
Metallurgical	do.	4,000	4,000	4,000	4,000	4,000
Breeze, all types	do.	250	250	250	250	250
Gas, natural, marketable[11]	billion cubic meters	83	76	74	68	59 [e]
Peat[e]	cubic meters	1,593	885	760	887 [r]	900 [e]
Petroleum:						
Crude[12]	thousand 42-gallon barrels	597,140	597,870	507,850	484,643	430,791
Refinery products	do.	641,433	627,333	612,632	610,000 [e]	610,000

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. -- Zero.

[1]Table includes data available through January 11, 2012.

[2]Produced entirely from imported bullion and includes the lead content of alloys.

[3]Includes a small quantity of primary lead from domestic concentrate.

[4]Refined nickel.

[5]Includes witherite.

[6]Reported figure.

[7]Sales, dry weight.

[8]Salable product.

[9]Proportions of grades not available; probably about two-thirds acid grade.

[10]Not elsewhere specified.

[11]Methane, excluding gas flared or reinjected.

[12]Excludes gases and condensates.

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TABLE 2
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Aluminum:			
Primary	Rio Tinto Alcan Ltd.	Lynemouth Smelter, Northumberland County, England	169
Do.	do.	Locchaber Smelter, Fort William, Scotland	41
Do.	Anglesey Aluminium Metal Ltd. (Rio Tinto Corp., 51%, and Kaiser Aluminum and Chemical Corp., 49%)	Holyhead, Gwynedd County, Wales	144
Secondary	Hydro Aluminium Deeside Ltd. (Hydro Aluminium AS)	Wrexham, Clwyd County, Wales	55
Do.	Cohen Alloys Ltd.	Glasgow, Scotland	NA
Do.	Coleshill Aluminium Ltd.	Coleshill, Warwickshire, England	NA
Do.	Dolgarrog Aluminium Ltd.	Dolgarrog, Conwy, Gwynedd County, Wales	9
Barite	M-I Drilling Fluids (UK) Ltd.	Foss Mine, near Aberfeldy, Perthshire County, Scotland	50
Do.	Glebe Mines Ltd.	Arthurton West, Bow Rake, High Rake, and Watersaw Mines, Southern Pennine Orefield, Derbyshire County, England	15
Celestite	Bristol Minerals Co. Ltd.	Yate, Avon County, England	30
Cement	Lafarge Cement UK, Ltd. (Lafarge Group)	Aberthaw plant, East Aberthaw, Barry, South Glamorgan County, Wales	500
Do.	do.	Barnstone plant, near Langar, Nottinghamshire County, England	-- [2]
Do.	do.	Cauldon plant, near Leek, Staffordshire County, England	1,000
Do.	do.	Cookstown plant, Cookstown, County Tyrone, Northern Ireland	500
Do.	do.	Dunbar plant, Dunbar, East Lothian, Scotland	1,000
Do.	do.	Hope plant, Hope Valley, Derbyshire County, England	1,300
Do.	do.	Northfleet plant, Northfleet, Kent County, England	1,000
Do.	do.	Westburyplant Westbury, Wiltshire County, England	700
Do.	Castle Cement Ltd. (Heidelberg Cement AG, 100%)	Ketton plant, Rutland County, near Stamford, Lincolnshire County, England	1,400
Do.	do.	Padeswood plant, Mold, Flintshire County, Wales	1,400
Do.	do.	Ribblesdale plant, Clitheroe, Lancashire County, England	1,400
Do.	CEMEX UK Operations, Ltd. (CEMEX, S.A.B. de C.V., 100%)	Rugby plant, Rugby, Warwickshire County, England	1,800
Do.	do.	Barrington plant, Barrington, Cambridgeshire County, England	300
Do.	do.	South Ferriby plant, North Lincolnshire County, England	800
Do.	Tarmac Buxton Lime and Cement Industries Ltd.	Tunstead plant, Buxton, Derbyshire County, England	800
Clay:			
Ball clay	WBB Minerals (S.C.R.-Sibelco NV)	Various operations in northern and southern Devon County, England	500
Do.	Imerys Group	Operations in Bovey and Wareham Basins, Dorset County, England	300
China clay (kaolin)	do.	Mines and plants in Cornwall and Devon Counties, England	3,000
Do.	WBB Minerals (S.C.R.-Sibelco NV)	Mines and plants in Cornwall County, England	1,000

See footnotes at end of table.

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TABLE 2—Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Coal			
Underground mines	UK Coal plc	Operations in England include the Daw Mill Colliery, Warwickshire County; the Kellingley Colliery, North Yorkshire County; the Maltby Colliery, Rotherham, Yorkshire County; the Thoresby Colliery, Nottinghamshire County; the Welbeck Colliery, Nottinghamshire County	30,000
Do.	Goitre Tower Colliery Ltd.	Tower Colliery, Hirwaun, Mid Glamorgan County, Wales	500
Surface pits	Scottish Coal Company Ltd.	Operations in Scotland include the Broken Cross pit near Douglas, South Lanarkshire County; Chalmerston pit, Dalmellington, East Ayrshire County; Chapelhill pit, South Lanarkshire County; Glentaggart pit, near Douglas, South Lanarkshire; Newbigging Farm pit, near Howgate, Midlothian County; Powharnal pit, near Muirkirk, East Ayrshire County; St. Ninians (Greenbank) pit, northeast of Dunfermline, Fife	4,000
Do.	ATH Resources PLC	Operations in Scotland include the Grievehill, the Laigh Glenmuir, and the Skares road pits in Ayrshire County; Glenmuckloch pit, Dumfries and Galloway County	1,600
Do.	Celtic Energy Ltd.	Margam pit, near Bridgend, Mid Glamorgan County, Wales	350
Do.	do.	Nant Helen Extension pit, Abercraf, West Glamorgan, County,Wales	400
Do.	do.	Selar pit, Glynneath, West Glamorgan County, Wales	400
Do.	Energybuild Ltd.	Nant-y-Mynydd pit, Neath, West Glamorgan County, Wales	130
Do.	H.J. Banks Mining (Banks Group)	Dehli pit, Stannington, Northumberland County, England	NA
Fluorspar	Glebe Mines Ltd.	Mill at Stoney Middleton, mines in Derbyshire County, England	60
Gold kilograms	Galantas Gold Corp.	Omagh Mine, near Omagh, County Tyrone, Northern Ireland	900 [3]
Gypsum	British Gypsum Ltd.	Several mines and quarries in England, which include the Barrow Mine, Barrow upon Soar, southeast of Loughborough, Leicestershire County; the Brightling Mine, Robertsbridge, East Sussex County; the Birkshead Mine, Kirby Thore, near Penrith, Cumbria County; the Fauld Mine, Tutbury, near Burton on Trent, Staffordshire County; the Kilvington Quarry, Staunton in the Vale, Kilvington, Nottinghamshire County; the Marbleegis Mine, East Leake, northeast of Loughborough, Leicestershire County; the Newbiggin Mine, Newbiggin, near Kirby Thore, Cumbria County	3,500
Lead:			
Primary	Britania Refined Metals Ltd. (Xstrata plc)	Northfleet, Kent County, England	180
Secondary	Britannia Recycling Ltd. (Xstrata plc)	Wakefield, West Yorkshire County, England	20
Do.	H.J. Enthoven Ltd. (Quexco Inc., 100%)	Darley Dale, Derbyshire County, England	75
Natural gas billion cubic meters per year	Numerous domestic and international oil companies	North Sea gasfields	100

See footnotes at end of table.

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TABLE 2—Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Nickel, refined		INCO Europe Ltd. (CVRD INCO Ltd.)	Clydach Refinery, near Swansea, West Glamorgan County, Wales	30
Nitrogen, N content of ammonia		Terra Nitrogen Ltd.	Billingham, Durham County, England, and Severnside, near Bristol, Avon County, England	550
Do.		GrowHow UK Ltd. (Kemira GroHow Oyj)	Ince, Lancashire County, England	400
Petroleum:				
Crude	million 42-gallon barrels per day	Numerous domestic and international oil companies, which include Apache North Sea Ltd., BG Group, BHP Billiton Ltd., BP p.l.c., Challenger Minerals Inc., Chevron Corp., ConocoPhillips, Dana Petroleum plc, Eni Ltd., Exxon Mobil Corp., Hess Corp., Lundin Britain Ltd., Maersk Oil UK Ltd., Marathon Oil U.K. Ltd., Midmar Energy Onshore Ltd., Nexen Petroleum Inc., Noble Energy (Europe) Ltd., Oilexco Inc., Perenco UK Ltd., Petro-Canada UK Ltd., Premier Oil plc, Royal Dutch Shell plc, Statoil (U.K.) Ltd., Talisman Ltd., Total S.A., and Tullow Oil (U.K.) Ltd.	North Sea oilfields	2
Refined	million 42-gallon barrels	Exxon Mobil Corp.	Fawley refinery, Southampton, Hampshire County, England	120
Do.	do.	Royal Dutch Shell plc	Stanlow manufacturing complex, Ellesmere Port, Cheshire County, England	100
Do.	do.	ConocoPhillips	Humber refinery, South Killingholme, North Lincolnshire County, England	90
Do.	do.	Total S.A.	Lindsey refinery, Killingholme, North Lincolnshire County, England	85
Do.	do.	Chevron Corp.	Pembroke refinery, Pembroke, Dyfed County, Wales	82
Do.	do.	Ineos Group	Grangemouth refinery, Grangemouth, Stirling County, Scotland	80
Do.	do.	BP p.l.c.	Coryton refinery, Stanford-le-Hope, Essex County, England	80
Do.	do.	Petroplus Holdings AG	Teesside refinery, Middlesborough, Cleveland County, England	43
Do.	do.	Total S.A., 70%, and Murco Petroleum Ltd., 30%	Milford Haven, Dyfed County, Wales	40
Do.	do.	Eastham Refinery Ltd. (Shell UK Ltd., 50%, and AB Nynas Ltd., 50%)	Eastham refinery, Ellesmere Port, Cheshire County, England	9
Do.	do.	AB Nynas Ltd.	Dundee refinery, Dundee, Scotland	4
Platinum-group metals		Johnson Matthey plc	Refineries at Enfield (London) and Royston, Hertfordshire County, England	NA
Do.		CVRD Inco Ltd.	Acton refinery, London, England	NA
Potash		Cleveland Potash Ltd. (Israel Chemicals Ltd., 100%)	Boulby Mine, Yorkshire County, England	1,000
Salt:				
Road		do.	do.	600
Rock		British Salt Ltd.	Middlewich, Cheshire County, England	800
Do.		Irish Salt Mining and Exploration Co. Ltd.	Kilroot Mine, Carrick Fergus, Northern Ireland	500
Sand and gravel		Hanson plc (Heidelberg Cement Group, 100%)	Various offshore and onshore locations	NA
Silica sand		WBB Minerals (S.C.R.-Sibelco NV)	Various operations in Cheshire, Humberside, and Norfolk Counties, England	5,000
Do.		Hanson plc	Various locations	NA

See footnotes at end of table.

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TABLE 2—Continued
UNITED KINGDOM: STRUCTURE OF THE MINERAL INDUSTRY IN 2010

(Thousand metric tons unless otherwise specified)

Commodity	Major operating companies and major equity owners	Location of main facilities[1]	Annual capacity
Slate, natural	Carillion P.L.C. (Welsh Slate Ltd., 100%)	Operations in Wales include the Penrhyn quarry, Bethesda, Conwy County; the Pen Yr Orsedd quarry, Nantlle, Gwynedd County; quarries at Blaenau Ffestiniog and Cwt y Bugail, Gwynedd County	1,000
Do.	Greaves Welsh Slate Company Ltd.	Llechwedd Slate Mines, Blaenau Ffestiniog, Gwynedd County, Wales	NA
Soda ash	Brunner Mond Group (Tata Chemicals Ltd.)	Northwich, Cheshire County, England	900
Steel	Tata Steel Europe (Tata Steel Group)	Scunthorpe Works, Scunthorte, Lincolnshire County, England	4,500
Do.	Tata Steel Europe Teesside Cast Products (Tata Steel Group)	Teesside Works, Redcar, Cleveland County, England	3,900
Do.	Tata Steel Europe Strip Products UK (Tata Steel Group)	Port Talbot works, Port Talbot, West Glamorgan county, Wales	3,750
Do.	Tata Steel Europe Engineering Steels (Tata Steel Group)	Rotherham Works, Rotherham, South Yorkshire County, England	1,200
Do.	do.	Stocksbridge Works near Sheffield, South Yorkshire County, England	NA [4]
Do.	Tata Steel Europe Special Profiles (Tata Steel Group)	Skinningrove, Carlin How, near Saltburn-by-the-Sea, Cleveland County, England	NA
Do.	Celsa Manufacturing Ltd. (Grupo Celsa, 100%)	Tremorfa Works, Cardiff, South Glamorgan County, Wales	850
Stone, crushed	Hanson plc	90 quarries in various locations	70,000
Talc	Alex Sandison and Son Ltd.	Unst, Shetland Islands	15
Tin, ore	Baseresult Holdings Ltd.	South Crofty Mine, Cornwall County, England	NA [5]

Do., do. Ditto. NA Not available. -- Zero.

[1]May include historic, postal, or preserved counties instead of current regional governments, such as cities, county boroughs, or unitary authorities.

[2]Grinding plant only. Kilns closed in May 2006.

[3]Under construction.

[4]Remelt facilities.

[5]Mine has been on care-and-maintenance status (but open for tours) since operations were suspended in 1998. Redevelopment of the mine is underway.

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The Mineral Industry of Uzbekistan

By Elena Safirova

Uzbekistan has large mineral reserves, which include more than 1,800 known mineral deposits. The most notable minerals are copper, gold, and uranium. Other significant mineral resources include bentonite, coal, fluorspar, gypsum, iodine, kaolin, lithium, oil and natural gas, silver, sulfur, tungsten, and zinc. Many minerals with known deposits were not being extracted. The volume of mineral production lagged behind the mining potential (based on Uzbekistan's known deposits) because of the country's inefficient infrastructure, remote location with respect to the world markets, and tight regulatory environment that did not attract considerable foreign investment (U.S. Central Intelligence Agency, 2012; U.S. Department of State, 2012; U.S. Energy Information Administration, 2012).

Minerals in the National Economy

In 2010, Uzbekistan's real gross domestic product (GDP) grew by an estimated 8.5%. The volume of exports increased by 10.8% compared with that of 2009, and exports were reported to be valued at $13.4 billion. The main export commodities were cotton, gold, oil and gas, and uranium. In 2010, the share of industrial production in the GDP was 23.9%. The main industries were the chemical sector, food processing, hydrocarbon extraction, machine building, metallurgy, mining, and textile manufacturing (State Committee of the Republic of Uzbekistan on Statistics, The, 2010; U.S. Central Intelligence Agency, 2012; U.S. Department of State, 2012).

Production

Reported data on the production of most minerals were not available. The estimated production volumes in table 1 were constructed based on a combination of news reports, producer data, and past production levels.

Structure of the Mineral Industry

Table 2 is a list of major mineral industry facilities.

Commodity Review

Metals

Copper.—The only producer of copper in Uzbekistan was the Almalyk mining and metallurgical complex (Almalyk GMK), which was located in Toshkent Province (Toshkent Viloyati). The two large copper porphyry deposits, the Kalmakyr and the Sary-Cheku deposits, were the main resources for the mining of copper. An additional copper deposit, Dal'nee, was on reserve. The mineral deposits of the Toshkent Viloyati are highly complex and contain more than 170 types of minerals. In addition to copper, the Almalyk GMK mined and processed lead-zinc-barite ores from the Uch-Kulach deposit located in Jizzax Viloyati. The Almalyk GMK produced about 90% of the silver and 20% of the gold output of Uzbekistan (Almalyk Mining-Metallurgical Complex, 2012).

In 2010, the Fund for the Reconstruction and Development of Uzbekistan (FRRU) agreed to provide the Almalyk GMK with a loan of $30 million for modernization of its copper production. FRRU was created by a decree of the President of Uzbekistan in 2006. The founders of the Fund were the Finance Ministry and the country's five largest commercial banks. Another future project of the Almalyk GMK was the production of 8- to 45-millimeter-sized copper pipes. The total cost of the project was estimated to be $18.7 million, and production was expected to begin in 2012 or 2013 (Mineral.ru, 2010; MetalDaily.ru, 2011).

Gold.—Uzbekistan's significant reserves of gold were estimated to total 5,300 metric tons (t). According to the Government Committee on Geology (Goskomgeo) of Uzbekistan, the country had 33 primary gold deposits. The main gold producers of the country were two Government-owned mining and metallurgical complexes—the Almalyk GMK and the Navoi mining and metallurgical complex (Navoi GMK). The Muruntau deposit in the Central Qizilqum region is thought to be unique in the world because of the high quality of its ores and the relatively low extraction costs. Another prospective gold deposit was the Tamdybulak, which is located 25 kilometers north of Muruntau. The Navoi GMK, which was the main producer of gold in Uzbekistan, started mining two new deposits in 2007—the Daugyztau and the Kakpatas deposits. The Navoi GMK produced about 60 million metric tons per year of gold (Regnum.ru, 2006; Navoi Mining and Metallurgical Combinat, 2012; Rustunnel.ru, 2012)

Mineral Fuels and Related Materials

Natural Gas and Petroleum.—Uzbekistan had significant hydrocarbon resources and was one of only a few countries that were not dependent on a foreign supply of energy. The country had 171 discovered oil and natural gas fields, 51 of which produced oil and 17 of which produced gas condensate. Because of aging production equipment, however, oil production had been decreasing since 2003, and the currently producing fields were being rapidly depleted. The Bukhara-Khiva region in southwestern Uzbekistan accounted for about 70% of the country's oil production. Uzbekistan signed several production-sharing agreements with foreign oil companies to refurbish existing fields and develop new basins. Two of these major foreign companies were Chinese National Petroleum Corp. (CNPC) of China and OAO Lukoil of Russia. Despite those industry revitalization efforts, Uzbekistan's oil production was expected to continue to decrease through at least 2013.

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Uzbekistan produced natural gas from 52 fields located at 12 major deposits. The deposits were concentrated on the Uzbek side of the Amu Darya basin in the southeast and in the Central Ustyurt plateau near the Aral Sea in the western part of the country. Uzbekistan consumed nearly 80% of its gas production for domestic use in the electricity production and heating sectors. Because it was the most populous country in Central Asia (28 million people in 2010), export needs had to compete with domestic demand. Uzbekistan exported about 24% of its gas production to Kazakhstan, Kyrgyzstan, Russia, and Tajikistan. The country hoped to triple its gas exports by 2020. In 2010, Uzbekneftegaz signed new agreements with OAO Gazprom of Russia and CNPC of China that covered imports of Uzbek gas to Russia and China, respectively. In the same year, the Export-Import Bank of China agreed to provide $74 million to modernize Uzbekistan's gas distribution network to facilitate gas delivery to China (U.S. Energy Information Administration, 2012; Uzbekinvest International Insurance Company Ltd., 2012).

Uranium.—The Navoi GMK had monopoly rights for the mining, beneficiation, and export of uranium as uranium oxide (U_3O_8). The Navoi GMK had three mining units and Hydrometallurgical Plant #1 (GMZ-1) that serviced the uranium line of business. The mineral base for uranium production at the Navoi GMK consisted of 20 deposits and 10 additional prospective areas. In the past 15 years, uranium production was done using the in situ leaching (ISL) method. As of 2010, six ISL mines were in operation. In the past several years, two new mines were commissioned on the Kendyktube and the Lyavlyakan deposits; pilot works were being conducted on the Sugraly and the Tokhtumbet deposits (Navoi Mining and Metallurgical Combinat, 2012).

In August 2009, the Chinese company CNPC Uranium Resources Co. and Uzbek Goskomgeo formed a 50-50 joint venture, Uz-China Uran, with an initial capital investment of $4.6 million. According to the joint-venture agreement, the Chinese partner would have priority rights for the purchase of uranium produced as a result of the venture, at world prices. In June 2010, Uz-China Uran started exploration at the Boztaus plateau in the Central Qizilqum region. According to Goskomgeo, uranium reserves at the Boztaus plateau were about 5,500 t. The company has thus far invested $2 million in mineral exploration (MinerJob.ru, 2010).

Outlook

Uzbekistan will likely seek to increase its production and export of hydrocarbons during the next decade by expanding its pipelines and modernizing its production facilities and infrastructure. The Government is also likely to continue to form partnerships with Asian and Russian firms to help achieve this objective.

The country is also expected to increase its production of uranium and gold. In the past several years, Uzbekistan has tried to modernize its Almalyk and Navoi GMKs and to ramp up production of copper and gold. Barring unforeseen events in the world economy, therefore, Uzbekistan's mineral production is expected to increase during the next decade.

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TABLE 1

UZBEKISTAN: PRODUCTION OF MINERAL COMMODITIES[1]

(Metric tons unless otherwise specified)

Commodity		2006	2007	2008	2009	2010
METALS						
Aluminum, secondary[e]		3,000	3,000	3,000	3,000	3,000
Copper:						
Mine output, Cu content		100,000	95,000	95,000	95,000 r	90,000
Metal:[e]						
Blister		95,000	92,000	92,000	92,000 r	92,000
Refined		92,300	89,655 2	71,000 r	80,000 r	90,000
Gold[e]	kilograms	85,000 r	85,000	85,000	90,000 r	90,000
Molybdenum, mine output, Mo content[e]		600	600	500	500	500
Rhenium[e]	kilograms	NA r	NA r	NA r	NA r	NA
Silver, mine output	do.	62,207 r	77,759 r	74,648 r	52,876 r	59,097
Steel:						
Crude		592,450	740,000 e	685,700 r	716,400	745,000 e
Rolled		560,000	700,000	640,000	670,000	700,000 e
Zinc, metal, smelter, primary		45,000 e	71,800	70,445	40,000 r,e	40,000 e
INDUSTRIAL MINERALS						
Cement[e]		5,700,000	6,500,000 2	6,600,000	6,850,000 r	6,872,000 2
Clays:[e]						
Bentonite		15,000	15,000	15,000	15,000	15,000
Kaolin		5,500,000 r	5,500,000 r	5,500,000 r	5,500,000 r	5,500,000
Feldspar[e]		4,300	4,300	4,300	4,300	4,300
Fluorspar[e]		88,000 2	90,000	90,000	90,000	90,000
Graphite[e]		60	60	60	60	60
Gypsum[e]		80,000	80,000	80,000	80,000	80,000
Iodine[e]	kilograms	2,000	2,000	2,000	2,000	2,000
Nitrogen, N content of ammonia[e]		940,000	1,000,000	1,000,000	1,000,000	1,000,000
Phosphate rock:[e]						
Gross weight		600,000	600,000	600,000	600,000	800,000
P_2O_5 content		140,000	140,000	140,000	140,000	187,000
Sulfur:[e]						
Byproduct:						
Metallurgy		170,000	170,000	170,000	170,000	170,000
Natural gas and petroleum		350,000	350,000	350,000	350,000	350,000
Total		520,000	520,000	520,000	520,000	520,000
Sulfuric acid		600,000 2	600,000	600,000	600,000	600,000
MINERAL FUELS AND RELATED MATERIALS						
Coal:						
Bituminous		109,000	160,000	198,000	101,000	198,000
Lignite		3,126,000	3,282,000	3,092,000 r	3,553,000 r	3,102,000
Total		3,235,000	3,442,000	3,290,000	3,654,000	3,300,000
Natural gas, dry	million cubic meters	62,750	65,186	67,593	65,000	59,439
Petroleum:						
Crude:						
In gravimetric units	thousand metric tons	3,007	3,017	2,533	2,331	1,866
In volumetric units[e]	thousand 42-gallon barrels	21,861	21,934	18,415	16,946	13,566
Petroleum refinery products:						
In gravimetric units	thousand metric tons	7,323	6,000 r	4,000 r	4,000 r	3,296
In volumetric units	thousand 42-gallon barrels	52,308	48,873	33,100	33,100	26,480
Uranium:						
U content		2,270	2,320	2,338	2,429 r	2,400
U_3O_8 content		2,677	2,736	2,757	2,865 r	2,830

[e]Estimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. [r]Revised. do. Ditto. NA Not available.

[1]Table includes data available through March 22, 2012.

[2]Reported figure.

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TABLE 2

UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Bismuth	Ustarassay deposit (depleted)	Chotqol and Kuraminskiy Khrebet regions	NA
Cesium, lithium, rubidium	Shava-Say deposit	NA	NA
Clays:			
Bentonite	Arab-Dasht and Khaudag deposits	NA	NA
Kaolin	Angren deposit	Angren region	8,000,000
Coal:			
Bituminous	JSC Shargunugol	Baysunskoye and Shargunskoye deposits, Surkhandarya region	1,000,000 [2]
Lignite	OJSC Uzbekcoal and OJSC Apartak	Angren deposit, Toshkent Viloyati	6,000,000
Copper:			
Mine output, Cu content	Almalyk mining and metallurgical complex	Dalneye, Kalmakyr, and Sary-Cheku deposits	100,000 [2]
Metal	Almalyk refinery	Olmaliq	130,000
Diamond	Karashok and Kok-Say deposits	Navoi Viloyati	NA
Feldspar	Karichasayskoye and other deposits	Deposits in Samarqand and Toshkent Viloyati; Qoraqalpog'iston Respublikasi	120,000 [2]
Fertilizers	Ammophos production association	Olmaliq	NA
Do.	Azot production association	Fergana area	NA
Do.	Elektrokhimprom production association	Chirchiq	NA
Do.	Kokand superphosphate plant	Qo'qon	NA
Do.	Naviazot production association	Navoiy Viloyati	NA
Do.	Samarkand chemicals plant	Samarqand Viloyati	NA
Fluorspar	Agata-Chibargata, Aurakhmat, Kengutan, Kyzylbaur, Naugarzan, and Nugisken deposits	East of Toshkent Viloyati	150,000
Do.	Syrpatash deposit	Namangan Viloyati	NA
Gold kilograms	Adzhi-Bugutty, Amantaytau, Balpantau, Bulutkan, Donguz-Tau, Muruntau, and Taurbay deposits	Central Qizilqum region	85,000 [2]
Do.	Navoi mining and metallurgical complex (Uzbekistan State Committee for Geology and Mineral Resources)	Muruntau deposit	65
Do.	Kochbulak and Kyzyl-Al'ma-Say deposits	Toshkent Viloyati	NA
Do.	Almalyk mining and metallurgical complex	Dalneye, Kalmakyr, and Sary-Cheku deposits	NA
Graphite	Tadzhi-Kazgan deposit	Navoiy Viloyati	NA
Iron ore	Syurenata deposit	Toshkent Viloyati	NA
Lead, mine output, Pb content	Almalyk mining and metallurgical complex; Altyn-Topkan and Uchkulach deposits	Uchkulach deposit in Toshkent Viloyati [Altyn-Topkan deposit is located in Tajikistan (in 1999, Altyn-Topkan was transferred to the control of Tajikistan)]	40,000 [2]
Manganese	Dautashskoye deposit	Qashqadaryo Viloyati	40,000
Molybdenum:			
Mine output, Mo content	Almalyk mining and metallurgical complex; Kalmakyr and Sary-Cheku deposits	Toshkent Viloyati	900 [2]
Metal	Uzbek refinery and hard metals plant	Chirchiq	NA
Natural gas million cubic meters	Gazli, Kandym, Khauzak, Kokdumalak, Pamuk, and Shurtan-Say deposits (major)	Amu-Dar'ya Basin; Muborak region	70,000 [2]
Do.	Itera Oil and Gax Co., OAO Lukoil, and Uzbekneftegaz JSC	Kan-Dam field	NA
Natural gas condensate	Trinity Energy	Ustyurt Platosi region	NA

See footnotes at end of table.

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TABLE 2—Continued

UZBEKISTAN: STRUCTURE OF THE MINERAL INDUSTRY IN 2010[1]

(Metric tons unless otherwise specified)

Commodity	Major operating companies, main facilities, or deposits	Location or deposit names	Annual capacity[e]
Natural gas liquids million cubic meters	Mubarek gas processing plant	Muborak region	28,000
Do.	Shurtan gas-chemical complex	Shurtan-Say deposit, Qashqadaryo Viloyati	137,000
Petroleum:			
Crude	Kokdumalak and Mingbulak deposits (major)	NA	9,000,000 [2]
Refinery products	Fergana oil refinery	Fergana area	8,800,000
Do.	Bukhara oil refinery	Buxoro area	2,500,000
Phosphate	Kyzyl Kum complex	Dzheroy-Sardarin Moroccan type; Karaktay, Severnyy, and Dzhetymtau deposits	NA
Polyethylene	Shurtan gas-chemical complex	Shurtan-Say deposit, Qashqadaryo Viloyati	125,000
Potash	Tyubegatan deposit	Southern Uzbekistan	NA
Rhenium	Almalyk mining and metallurgical complex	Toshkent Viloyati	NA
Selenium	do.	do.	NA
Silver	do.	do.	NA
Do.	Kosmanachi, Okzhetpes, and Vysokovoltnoye deposits	Namangan Viloyati	NA
Steel, crude	Bekabad steel mill	Bekobod area	1,100,000
Sulfur	Almalyk mining and metallurgical complex	Dalneye, Kalmakyr, and Sary-Cheku deposits	NA
Do.	Mubarek gas processing plant complex	Muborak region	2,000,000
Tellurium	Almalyk mining and metallurgical complex	Toshkent Viloyati	NA
Tungsten:	Deposits:	Locations:	1,200 [2]
Mine output, W content	Koytash deposit	Northeastern Uzbekistan	
	Ingichka and Lyangar deposits	Zirabulak Mountains	
	Ugat deposit	Northern Uzbekistan	
Mine output, WO_3 content (0.49%)	Sautbay wolframite deposit	Qizilqum region	NA
Metal	Uzbek refractory and hard metals plant	Chirchiq	NA
Uranium, U content	Navoi mining and metallurgical complex	Central Qizilqum region	3,000
Vermiculite cubic meters	Tebin-Bulak deposit	NA	25,000
Zinc:			
Mine output, Zn content	Almalyk mining and metallurgical complex	Khandiza and Uchkulach deposits	NA
Metal	do.	do.	80,000

[e]Estimated; estimated data are rounded to no more than three significant digits. Do., do. Ditto. NA Not available.

[1]Many location names have changed since the breakup of the Soviet Union. Many enterprises, however, are still named or commonly referred to based on the former location name, which accounts for discrepancies in the names of enterprises and that of locations.

[2]Capacity estimates are totals for all enterprises that produce that commodity.

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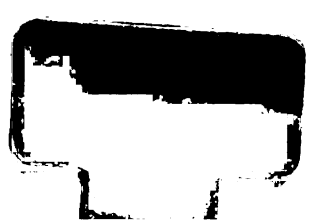

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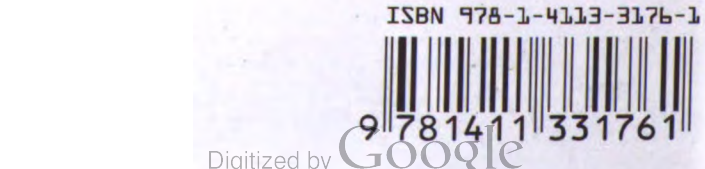

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